ORDER NO.SIMMC0303012C2

# Service Manual

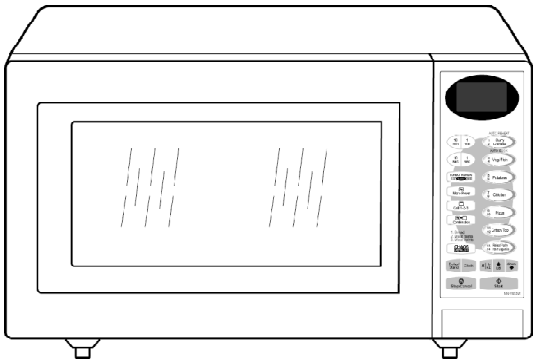
## Microwave Oven

## NN-V653WF NN-V653CF / NN-V623MF NN-F663WF / NN-F653WF NN-F623MF / NN-V453WF NN-V423MF / NN-T553WF NN-T523MF / NN-T543WF NN-Q553WF / NN-Q523MF NN-Q543WF

## BPQ(U.K.)

## GPG(Germany)

## EPG(France, Italy, Finland, Spain, Portugal, Greece, Poland, Holland)



## SPECIFICATIONS

Specifications: (For Grill Models)

| Specifications \ Models | | V653WF/CF BPQ<br>V623MF BPQ | V653WF/CF GPG<br>V623MF GPG | V453WF BPQ | V453WF GPG<br>V423MF GPG | F663WF EPG<br>F623MF EPG | F653WF EPG |
|---|---|---|---|---|---|---|---|
| Power Source: | | 230V AC Single Phase,50Hz---------- For GPG,EPG Models.<br>230V-240V AC Single Phase,50Hz---------- For BPQ Models. | | | | | |
| Power Requirement: | Microwave | 1260W | 1260W | 1160W | 1160W | 1260W | 1260W |
| | Heater | 1350W | 1350W | 1150W | 1150W | 1350W | 1350W |
| Output: | Microwave(IEC60705) | 1000W | 1000W | 1000W | 1000W | 1000W | 1000W |
| | Heater | 1300W | 1300W | 1100W | 1100W | 1300W | 1300W |
| Microwave Frequency: | | 2450MHz | | | | | |
| Timer: | | 99min.99sec | | | | 30min.(HIGH POWER)/99min. | |
| Outside Dimensions: | | 510mm(D) x 380mm(W) x 304mm(H) | | | | | |
| Oven Cavity Dimensions: | | 359mm(D) x 352mm(W) x 217mm(H) | | | | | |
| Weight: | | 12.5kg | | | | | |
| PbF | | This product with PbF | | | | | |
| Output power: IEC60705 Test Procedure | | | | | | | |
| Specifications subject to change without notice. | | | | | | | |

Specification: (For Solo Models)

| | T553WF BPQ | T523MF BPQ | T543WF BPQ | Q553WF EPG | Q523MF EPG | Q543WF EPG |
|---|---|---|---|---|---|---|
| Power Source: | 230V AC Single Phase,50Hz---------- For GPG,EPG Models.<br>230V-240V AC Single Phase,50Hz---------- For BPQ Models. | | | | | |
| Power Requirement: | 1260W | 1260W | 1160W | 1260W | 1260W | 1160W |
| Output(IEC60705) | 1000W | 1000W | 1000W | 1000W | 1000W | 1000W |
| Microwave Frequency: | 2450MHz | | | | | |
| Timer: | 99min.99sec | | | | 30min.(HIGH POWER)/99min. | |
| Outside Dimensions: | 510mm(D) x 380mm(W) x 304mm(H) | | | | | |
| Oven Cavity Dimensions: | 359mm(D) x 352mm(W) x 217mm(H) | | | | | |
| Weight: | 11.5kg | | | | | |
| PbF | This product with PbF | | | | | |
| Output power: IEC60705 Test Procedure | | | | | | |
| Specifications subject to change without notice. | | | | | | |

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## ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

## WARNING

1. This product should be serviced only by trained, qualified personnel.
2. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage."
3. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
4. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts be replaced only with the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the orginal design.

This service manual covers products for following markets.
When troubleshooting or replacing parts, please refer to the country identifications shown below for your applicable product specification.

BPQ ..... For U.K.

GPG ..... For Germany

EPG ..... For France, Italy, Finland, Spain
Portugal, Greece, Poland, Holland

## CAUTION

**About lead free solder (PbF)**

**Distinction of PbF PCB:** PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

**Caution:**
- Pb free solder has a higher melting point than standard solder; Typically the melting point is 30 - 40˚C higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 370 ± 10˚C.
- Pb free solder will tend to splash when heated too high (about 600˚C).

Panasonic®

DANGER OF HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LIVE) OF THE INVERTER POWER SUPPLY **(U)**

## INVERTER WARNING

**This Inverter board looks like a regular PCB. However, this PCB drives the magnetron tube with extremely high voltage and high current.** NEW H.V.

**IT HAS:**

1. **Very high voltage and high current circuits.**
   **It functions the same as the high voltage transformer and high voltage capacitor in ordinary microwave ovens.**
2. **Aluminum heat sink is energized with very high voltages and high heat energy.**
3. **Very high voltage may remain in circuitry even when oven is off. High voltage charge may remain in the capacitors on the board.**

**DO NOT:**

* 1. **Do not touch circuitry because it has very hot (high voltage) circuitry. Even when replacing board, extreme care should be taken to avoid possible electric shock hazards. High voltage charge may remain in circuit.**

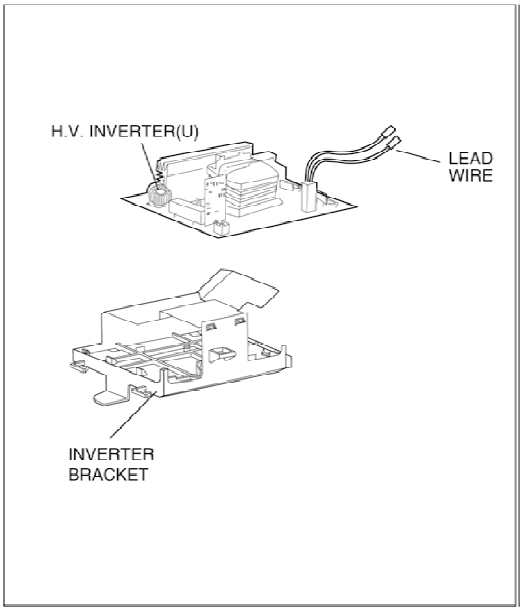
* 2. **Do not touch aluminum heat sink because it is energized with very high voltage and also is very hot in high heat energy.**

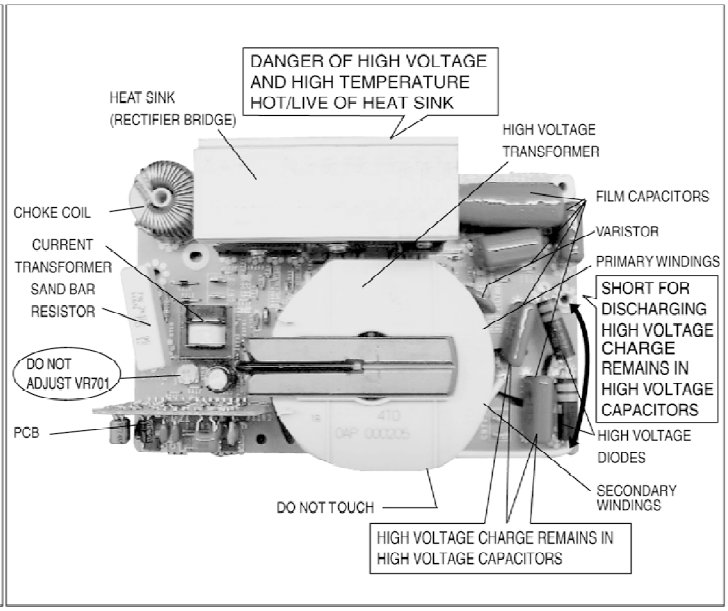
* 3. **Do not try to adjust or tamper with preset control on the Inverter board because it is very dangerous to adjust without proper test equipment.**

* 4. **Do not test oven while Inverter grounding plate or screws are loose. It is very dangerous to operate H.V. Inverter Circuit (U) with loose mounting screws or if improperly grounded.**

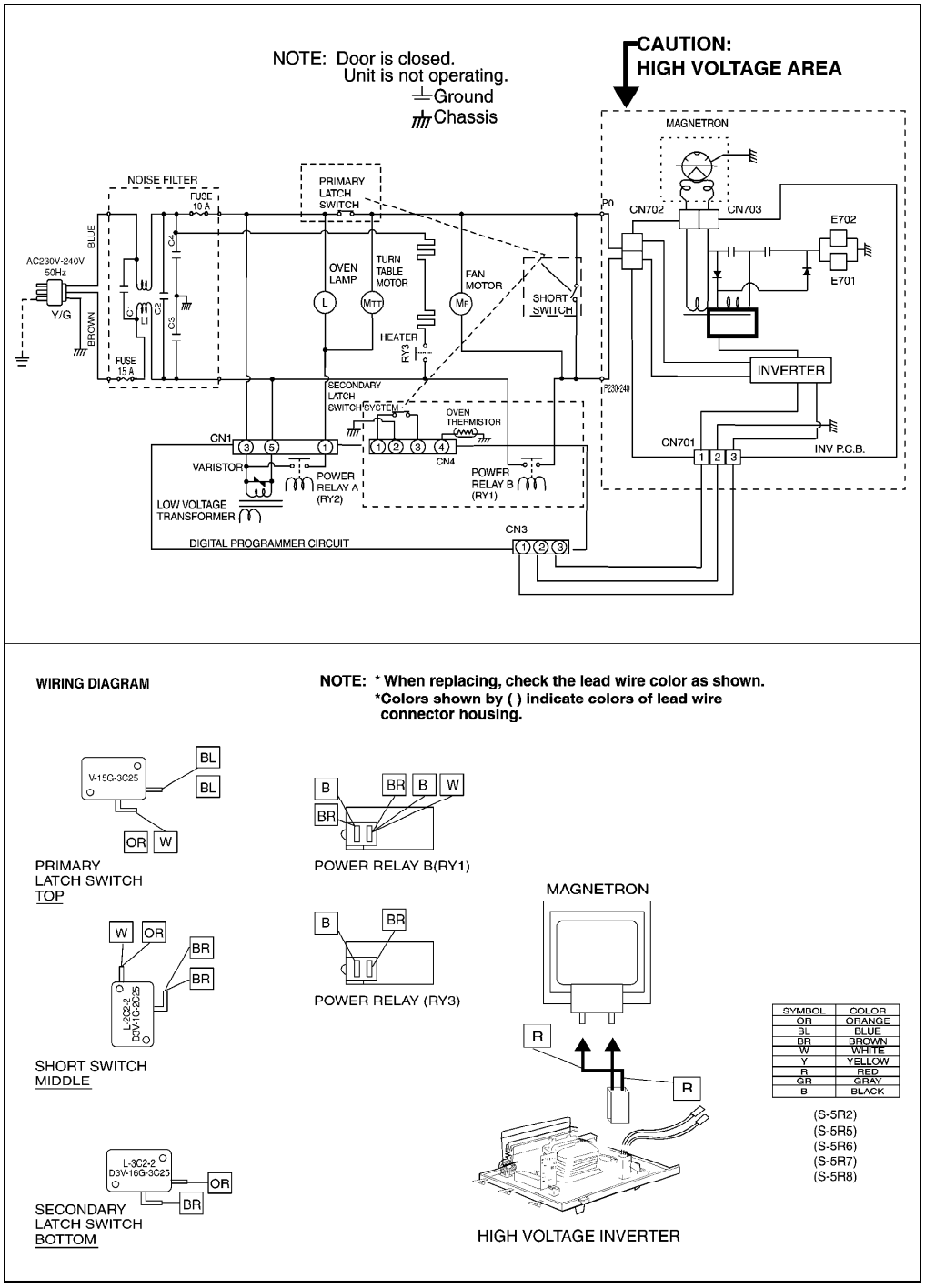
* 5. **Do not try to repair Inverter PCB because it is very dangerous to repair. Replace as a complete High Voltage Inverter Circuit unit.**

## INVERTER POWER SUPPLY

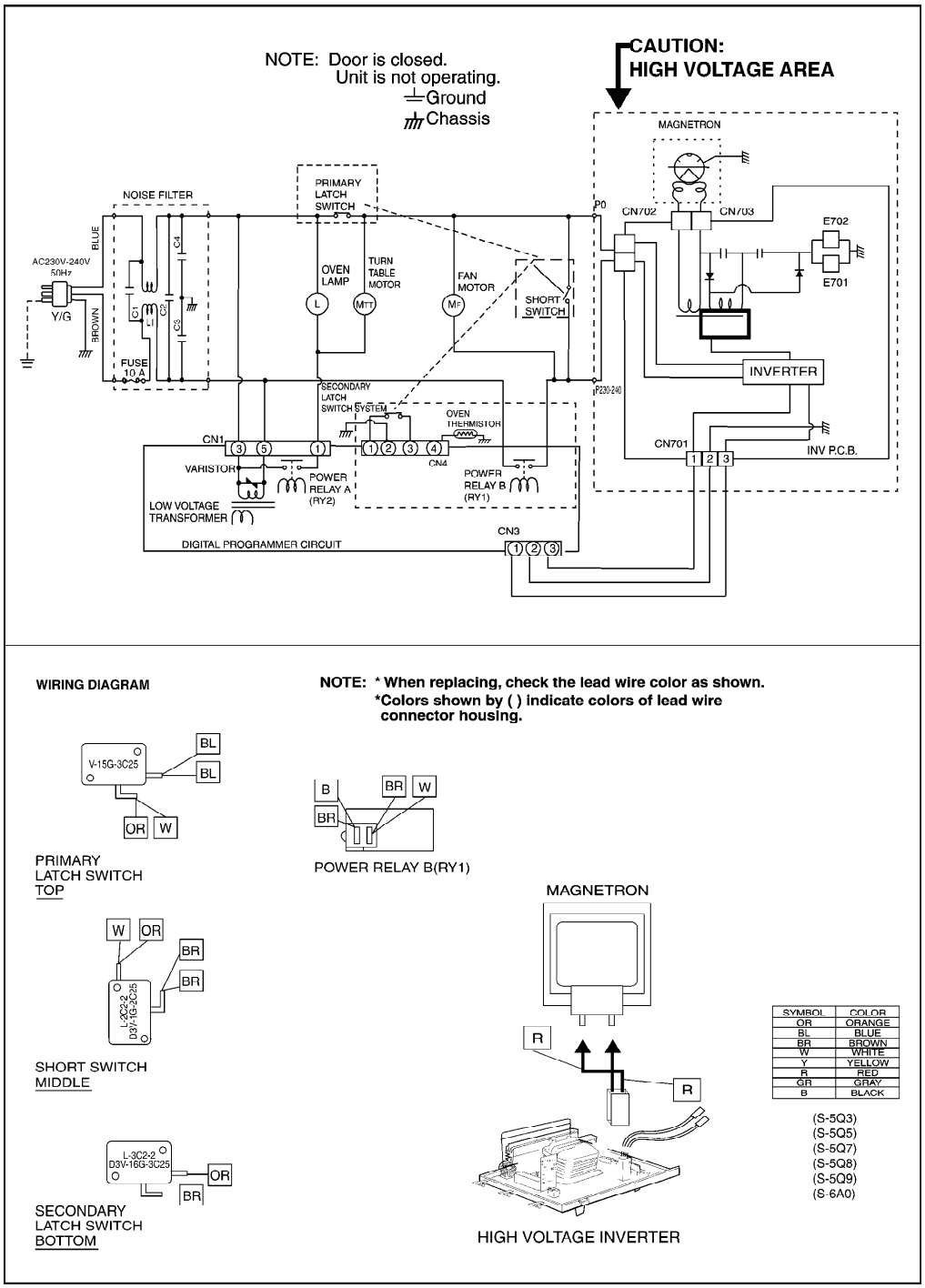


# 1. SCHEMATIC DIAGRAM (FOR GRILL MODELS)




# 2. SCHEMATIC DIAGRAM (FOR SOLO MODELS)




# 3. DESCRIPTION OF OPERATING SEQUENCE

## 3.1. Variable power cooking control

**High Voltage Inverter Power supply (U) controls output power by the signal from Digital Programmer Circuit (DPC). Power relay stays ON for P4 to P10 and For P1 to P3, both inverter drive signal and power relay to control output power.**

**NOTE:**

**The ON/OFF time ratio does not correspond with the percentage of**

**microwave power since approximately 2 seconds are required for heating of magnetron filament.**

Variable Power Cooking

| POWER SETTING | | OUTPUT POWER(%) APPROX. | ON-OFF TIME OF POWER RELAY (RY1) | |
|---|---|---|---|---|
| | | | ON(SEC) | OFF(SEC) |
| HIGH | P10 | 100% | 22 | 0 |
| | P9 | 90% | 22 | 0 |
| | P8 | 80% | 22 | 0 |
| MEDIUM-HIGH | P7 | 70% | 22 | 0 |
| MEDIUM | P6 | 60% | 22 | 0 |
| | P5 | 50% | 22 | 0 |
| | P4 | 40% | 22 | 0 |
| MEDIUM-LOW | P3 | 30% | 22 | 0 |
| | P2 | 20% | 15 | 7 |
| | P1 | 10% | 8 | 14 |
| DEFROST | P3 | 30% | 22 | 0 |

## 3.2. Inverter power supply circuit [NEW H.V.]

**This Inverter Power Supply Circuit supplies 4,000V DC to the magnetron tube from the line voltage, 230-240V 50Hz AC input. functions as the H.V. transformer, the H.V.capacitor and H.V.Diode.**

1. **The AC input voltage 230-240V 50Hz is rectified to DC voltage immediately.**
2. **DC voltage will be supplied to the switching devices called IGBT. These devices will be switched ON-OFF by the 20 to 40 kHz PWM. (pulse width modulation) signal from the microcomputer in the DPC.**
3. **This drives the High voltage transformer to increase up to 2,000V AC and approximately 3V AC by means of transformer.**
4. **Then the half-wave doubler voltage rectifier circuit, consisting of the H.V. diodes and Capacitors, generates the necessary 4,000V DC needed for the magnetron.**
5. **Output power of the magnetron tube is always monitored by the signal output from the current transformer built into the inverter circuit.**
6. **Then this signal will be fed back to the microcomputer in the DPC**

to determine operating conditions and output necessary to control PWM signal to the inverter Power Supply to control output power.

### 3.3. Inverter turbo defrost

**When this Auto Control feature is selected and the Start Pad is tapped:**

1. The digital programer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window. Table shows the corresponding cooking times for respective serving by categories.
2. When cooking time the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.

# 4. CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

**Unlike many other appliances, the microwave oven is a high voltage, high current device. It is free from danger in ordinary use, though extreme care should be taken during repair.**

**Caution**

**Servicemen should remove their watches whenever working close to or replacing the magnetron.**

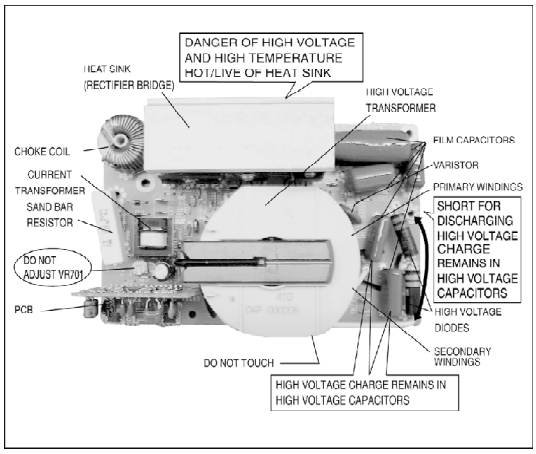
### 4.1. Check the grounding

**Do not operate on a two wire extension cord. The microwave oven is designed to be grounded when used. It is imperative, therefore, to ensure the appliance is properly grounded before beginning repair work.**

### 4.2. Inverter warnings

**DANGER, HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LINE) OF THE INVERTER POWER SUPPLY (U)**

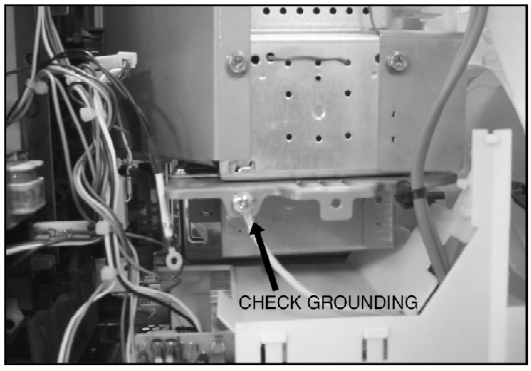
**This high voltage inverter power supply handles very high voltage and current for the magnetron tube. Though it is free from danger in ordinary use, extreme care should be taken during repair.**
**The aluminum heat sink is also energized with high voltage (HOT), so do not touch when the AC input terminals are energized. The power devices Collector is directly connected to the aluminum heat sink.**
**The aluminum heat sink may be HOT due to heat energy, therefore, extreme care should be taken during servicing.**




**H.V. Inverter warning**

## WARNING FOR INVERTER POWER SUPPLY (U) GROUNDING

**Check the high voltage inverter power supply circuit grounding. The high voltage inverter power supply circuit board must have a proper chassis ground, the inverter grounding bracket must be connected to the chassis. If the inverter board is not grounded it will expose the user to very high voltages and cause extreme DANGER! Be sure that the inverter circuit is properly grounded via the inverter earth bracket.**

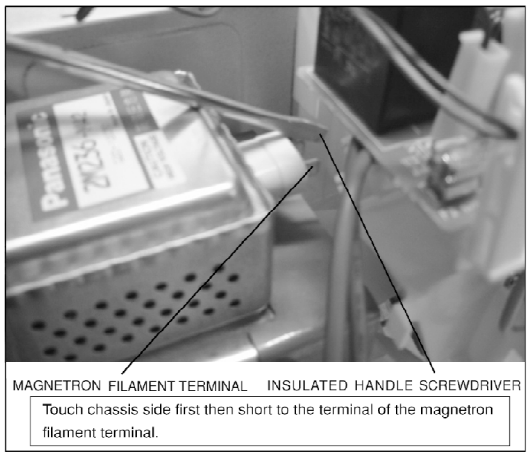



**Grounding of the inverter circuit board**

## WARNING! DISCHARGE THE HIGH VOLATGE CAPACITORS

**For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitors in the inverter power supply circuit board.**

**When replacing or checking parts, remove the power plug from the outlet and short the inverter output terminal of the magnetron filament terminals to the chassis ground with an insulated handle screwdriver to discharge. Please be sure to touch the chassis ground side first and then short to the output terminals.**


MAGNETRON FILAMENT TERMINAL
INSULATED HANDLE SCREWDRIVER
Touch chassis side first then short to the terminal of the magnetron filament terminal.

**Discharging the high voltage capacitors**

**WARNING**

**There is high voltage present with high current capabilities in the circuits of the primary and secondary windings, choke coil and heat sink of the inverter. It is extremely dangerous to work on or near these circuits with the oven energized. DO NOT measure the voltage in the high voltage circuit including the filament voltage of the magnetron.**

**WARNING**

**Never touch any circuit wiring with your hand or with an insulated tool during operation.**

## 4.3. Part replacement.

**When any part or component is to be replaced, always ensure that the power cord is removed from the wall outlet.**

## 4.4. When the 10A fuse is blown due to the operation of the short switch:

**WARNING**

**When the 10A 250V fuse is blown due to the operation of the interlock monitor switch, replace all of the components (primary latch switch, secondary latch switch, short switch and power relay B (RY1)).**

1. **This is mandatory. Refer to “adjustments and measurements” for the location of these switches.**
2. **When replacing the fuse, confirm that it has the appropriate rating for these models.**
3. **When replacing faulty switches, be sure the mounting tabs are**

not bent, broken or deficient in their ability to hold the switches.

## 4.5. Avoid inserting nails, wire etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any holes or gaps, because such objects may work as an antenna and cause microwave leakage.

## 4.6. Confirm after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. Microwaves might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
3. Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage).

**CAUTION MICROWAVE RADIATION**

USE CAUTION NOT TO BECOME EXPOSED TO RADIATION FROM THE MICROWAVE MAGNETRON OR OTHER PARTS CONDUCTING MICROWAVE ENERGY

**IMPORTANT NOTICE**

The following components have potentials above 2000V while the appliance is operated.

- Magnetron
- High voltage transformer (Located on inverter (U))
- High voltage diodes (Located on inverter (U))
- High voltage capacitors (Located on inverter (U))

Pay special attention to these areas.

When the appliance is operated with the door hinges or magnetron fixed incorrectly, the microwave leakage can exceed more than 5mW/cm$_2$. After repair or exchange, it is very important to check if the magnetron and the door hinges are correctly installed.

## 4.7. Sharp edges

**Caution**

Please use caution when unpacking, installing or moving the unit, as some exposed edges may be sharp to the touch and cause injury if not handled with care.

# 5. DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

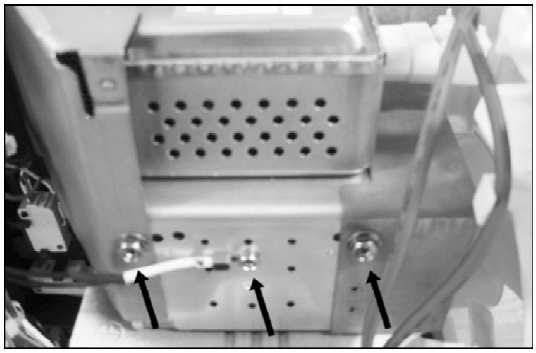
## 5.1. Magnetron

1. Discharge high voltage charge.
2. Remove 1 screw holding air guide A.
3. Remove 1 screw holding air guide F.
4. Remove 4 screws holding themistor.
5. Disconnect 2 high voltage lead wires from magnetron filament terminals.
6. Remove 4 screws holding the magnetron.

**NOTE:**

**After replacement of the magnetron, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.**

| CAUTION |
| --- |
| When replacing the magnetron, be sure the antenna gasket is in place. |



## 5.2. Digital programmer circuit (D.P.C) and membrane key board.

**NOTE:**

**Before handing the D.P.C ensure that your body is connected to ground to discharge any electric charge.**

1. Disconnect all connectors from D.P.C.
2. Remove 1 screw holding escutcheon base and slide the escutcheon base upward slightly.

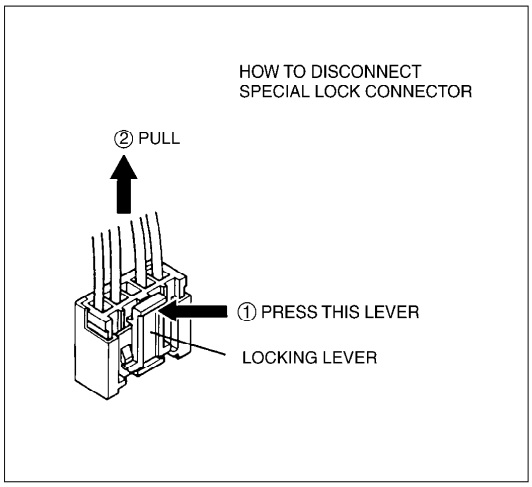
3. Remove 1 screw holding D.P.C.
4. Release lock of connector CN6 by pushing both levels to inside and pull them upward, and remove flat cable of membrane keyboard.
5. Separate D.P.C board from tabs on the escutcheon base and remove D.P.C board.

**To replace membrane key board**

6. Push the upper part of key board (display window portion) from back of escutcheon base and peel off escutcheon sheet and membrane key board completely from escutcheon base.

**NOTE:**

**1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal. / 2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided. / 3. Alignment position of membrane key board is as follows; / Membrane key board: Right and upper edges / Escutcheon sheet: Right and upper edges**




## 5.3. Low voltage transformer and/or power relays (RY1, RY2)

**NOTE:**

**Be sure to ground any static electric charge built up on your body before handling the DPC.**

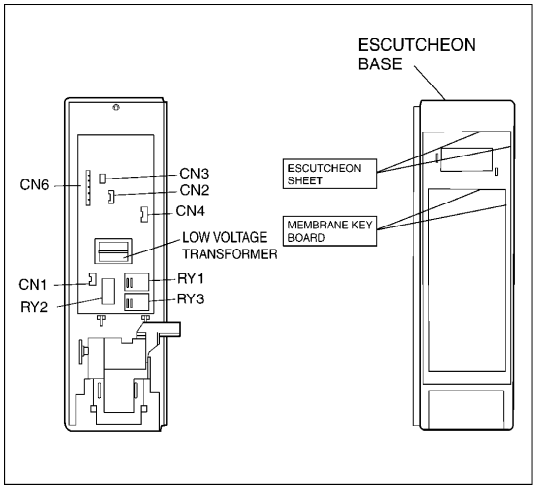
**(A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder**

**from the terminal pins of the low voltage transformer and/or power relays.**

**NOTE:**

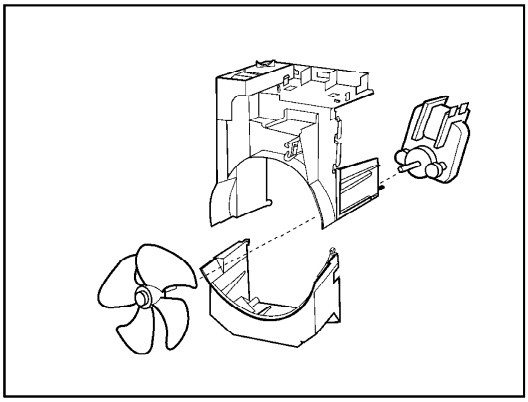
**Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.**

**(B) With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.**




## 5.4. Fan motor

1. Disconnect 2 lead wires from fan motor terminals.
2. Remove 1 screw located on oven attaching orifice assembly.
3. Remove orifice from oven assembly.
4. Remove 2 screws holding fan motor to oven assembly.
5. Remove fan blade from the fan motor shaft by pulling it straight out.



## 5.5. Door assembly

1. Remove door C from door E by carefully pulling outward starting

from upper right hand corner using a flat blade screwdriver.

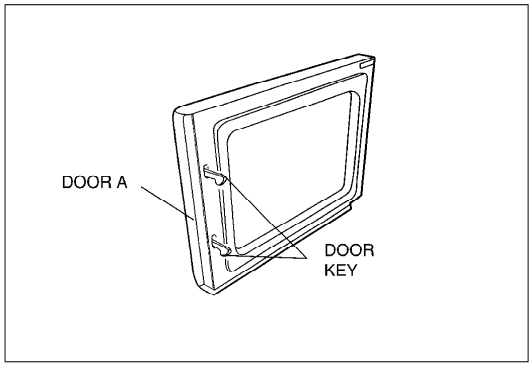
2. Separate door E from tabs on door A and remove door A.
3. Open Door E at the opening angle of approximately 10°(Note: The door cannot be removed if the opening angle is greater than 10°).
4. Remove the door E from its hinges by pushing the door E upward and out.
5. Remove door screen B from door A.
6. Remove door key and door key spring.
7. Place the door's lower hinge pin into the bottom hinge hole.
8. Use your left index finger to support the door's lower hinge pin while guiding the door's upper hinge pin into the top hinge hole.
9. Lower your finger to seat the door onto the hinges.
10. Replace other components.

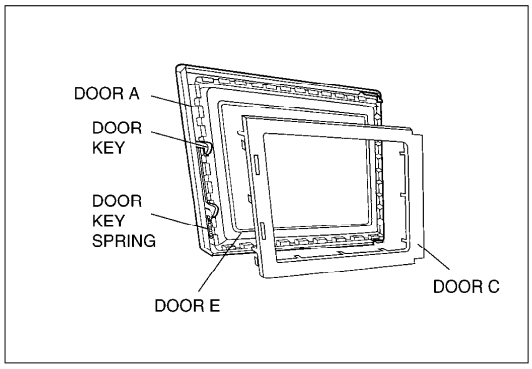
**NOTE:**

**Door alignment is crucial. If door is misaligned, apply pressure until alignment is achieved.**

**NOTE:**

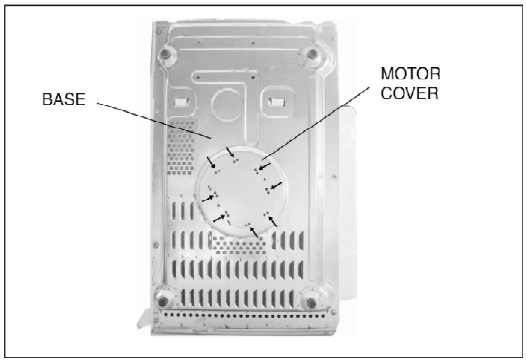
**After replacement of the defective component parts of the door, reassemble, install, and perform microwave leakage test.**

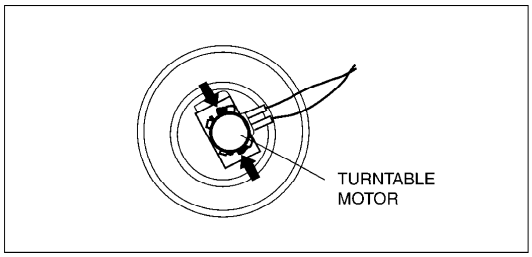





## 5.6. Turntable motor

1. **Remove the motor cover by cutting at the locations indicated by the arrows with a cutter.**
   **NOTE:**
   **After removing the motor cover, be sure that cut portions are properly trimmed or bent to the inside so that no sharp edges will be exposed to outside.**
2. **Disconnect 2 lead wires connected to the turntable motor.**
3. **Remove the turntable motor by removing screw.**
   **NOTE:**
   **After replacing the new turntable motor and reconnecting the two lead wires, reinstall the motor cover by rotating it 180°, tucking the tabs into the base in the 2 provided slots, then screw the single tab to the base using a 4mm X 6mm screw (not provided). /**



## 5.7. Steam sensor

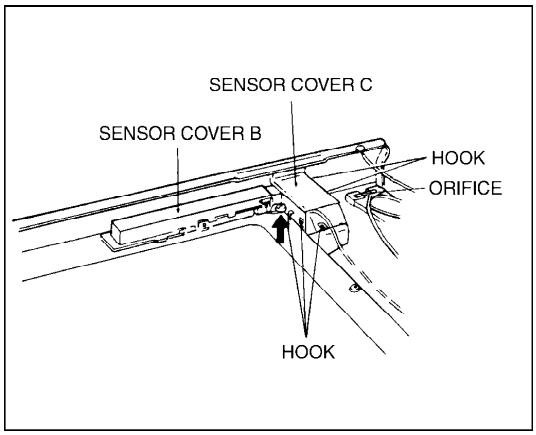
**1. Disconnect connector CN2 from digital programmer circuit board.**

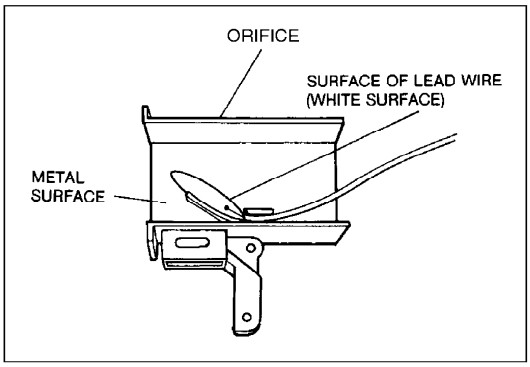
**2. Disengage catch hooks on sensor cover c from orifice.**

**3. Remove steam sensor from orifice.**

**NOTE:**

**When installing the steam sensor, make sure that the direction of steam sensor is as shown in figure. /**



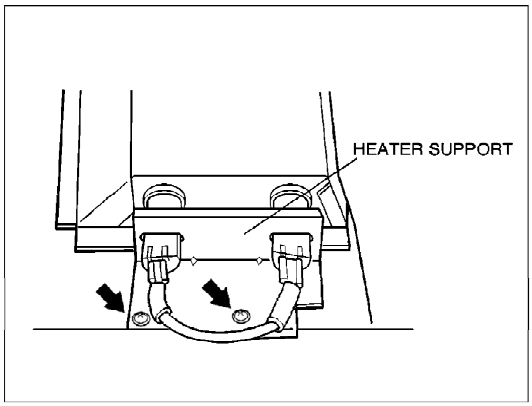



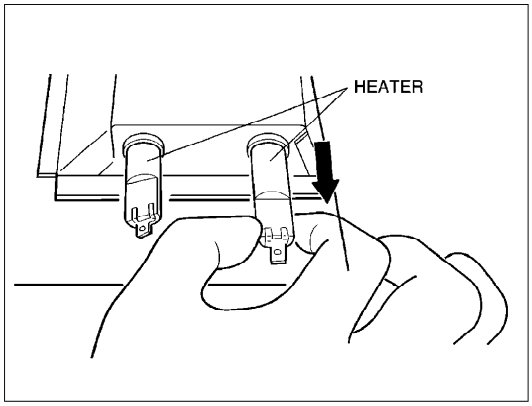

## 5.8. Quartz heater(For Brown Models)

**1. Disconnect lead wires from heater terminals.**

**2. Remove 2 screws holding heater supports.**

**3. Remove the heater by pulling it out.**




## 5.9. Inverter power supply

**CAUTIONS**

**1.Always leave the grounding plate in place.**

**2.Always securely tighten the ground screw through the bottom of the chassis (base).**

**3.Securely connect 3 lead wire connectors.**

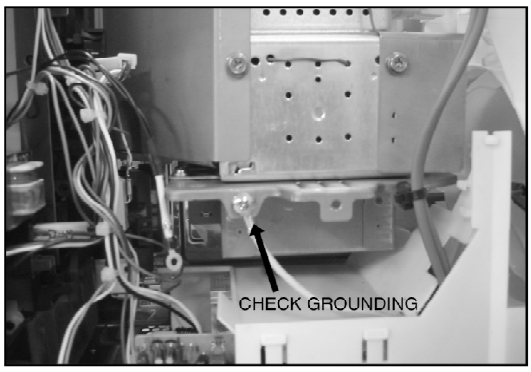
**4.Make sure the heat sink has enough space (gap) from the oven. Take special care not to touch any lead wire to the aluminum heat sink because it is hot.**

**1. Remove cabinet outer panel.**

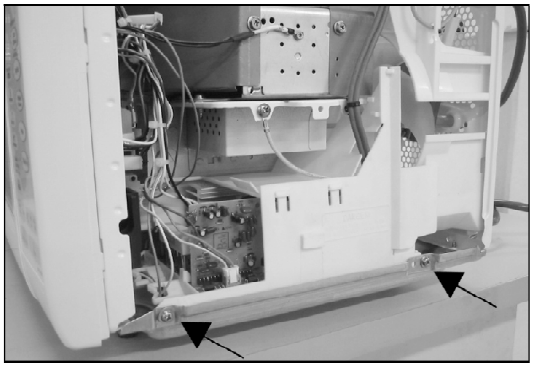
**2. Remove the the H.V.lead wire from magnetron terminals.**

**3. Disconnect 2 connectors from CN701 & CN702 on H.V.Inverter(U).**

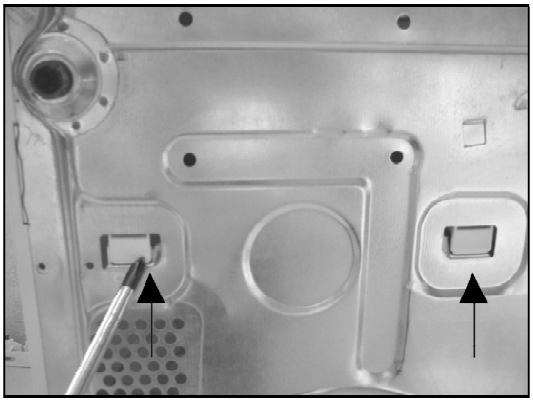
**4. Remove 1 screw holding grounding lead wire.**



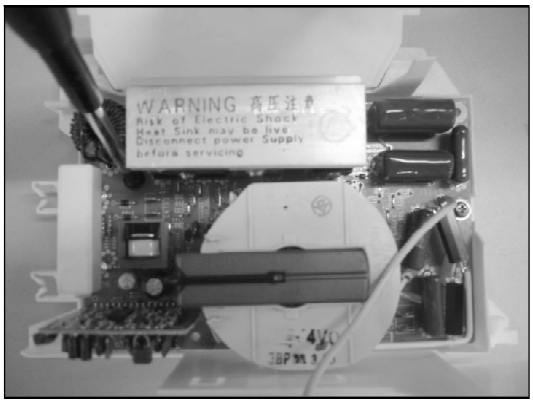

**5. Remove 2 screws holding Inverter bracket to the base.**



**6. Slide 2 locking tabs of Inverter bracket at the bottom of the base in direction of arrows.**



**7. Remove 2 screws holding H.V.Inverter to Inverter bracket.**



# 6. COMPONENT TEST PROCEDURE

**CAUTION [NEW. H.V.]**

**1. High voltage is present at the high voltage terminal of the High Voltage Inverter (U) including aluminum heat sink during any cook cycle.**

**2. It is neither necessary nor advisable to attempt measurement of the high voltage.**

**3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitors.**

## 6.1. Primary latch switch (Secondary latch switch and power relay B) interlocks.

1. **Unplug the lead connectors to Power Relay B and verify continuity of the power relay B 1-2 terminals.**
2. **Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.**
3. **Test the continuity of switches at door opened and closed positions with ohm meter (low scale). / Normal continuity readings should be as follows.**

| | Door Closed | Door Opened |
|---|---|---|
| Primary Latch Switch | 0 Ω (close) | ∞ Ω (open) |
| Secondary Latch Switch | 0 Ω (close) | ∞ Ω (open) |
| Power Relay B | ∞ Ω (open) | ∞ Ω (open) |

## 6.2. Short switch & monitor

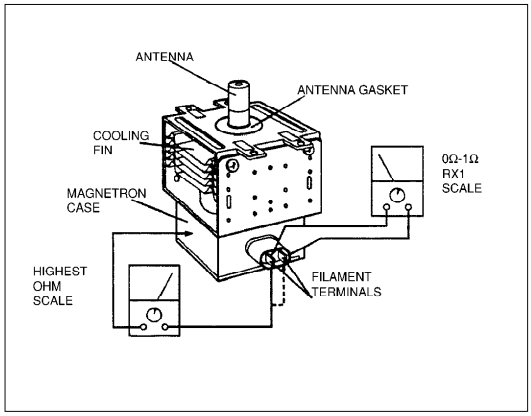
1. Unplug lead wires from Inverter Power Supply (U) primary terminals.
2. Connect test probes of ohm meter to the disconnected leads which were connected to Inverter Power Supply (U).
3. Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter. / Normal continuity readings should be as follows.

| Door Opened | Door Closed |
|---|---|
| 0 Ω | ∞ Ω |

## 6.3. Magnetron

**Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.**

1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.

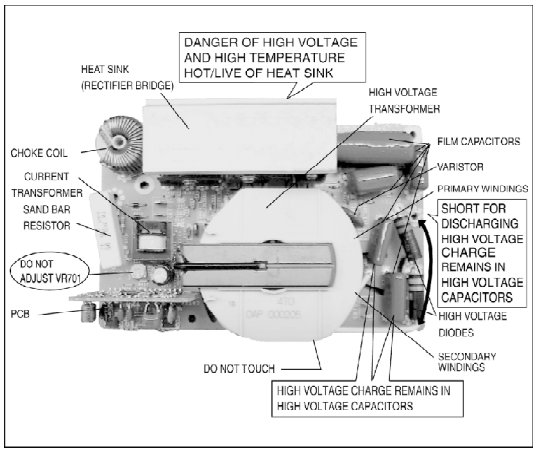



## 6.4. Membrane key board (Membrane switch assembly)

**Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.**

## 6.5. Inverter power supply (U)

**DO NOT try to REPAIR H.V. Inverter power supply (U).Replace complete H.V. Inverter(U) Unit.**




**DANGER HIGH VOLTAGE**

**Test if failure codes of H97 or H98 appear by doing the following procedure. It is recommended to use an AC line input current Ampere meter for testing.**

**Test1**

1. **Program DPC.**
   - **A. Tap Clock Keypad**
   - **B. Tap Timer Keypad**
   - **C. Tap Start Keypad**
   - **D. Tap Micro Power Keypad**
2. **Place 1 liter of water load into oven cavity.**
3. **Unplug 2 pin H.V. lead wire connector CN703 from magnetron tube.**
4. **Program oven at High power for 1 minute and press start.**
   - **A. After approximately 23 seconds, oven stops.**
   - **B. During oven operation, input current is approximately 0.5 to 1A.**

   **If both a and b are OK, proceed to test 2.**

| | INPUT AMPERE | FAILURE CODE |
|---|---|---|
| Unplug CN703 | 0.5 to 1A | Oven stops in 23 seconds after started. |

**Test2**

**Continued from Test 1**

1. Unplug 3 pin connector CN701. CN703 remains unplugged.
2. Program oven at High power for 1 minute and press start.
   A. After approximately 3 seconds, oven stops.
   B. During oven operation, input current is approximately 0.4A.

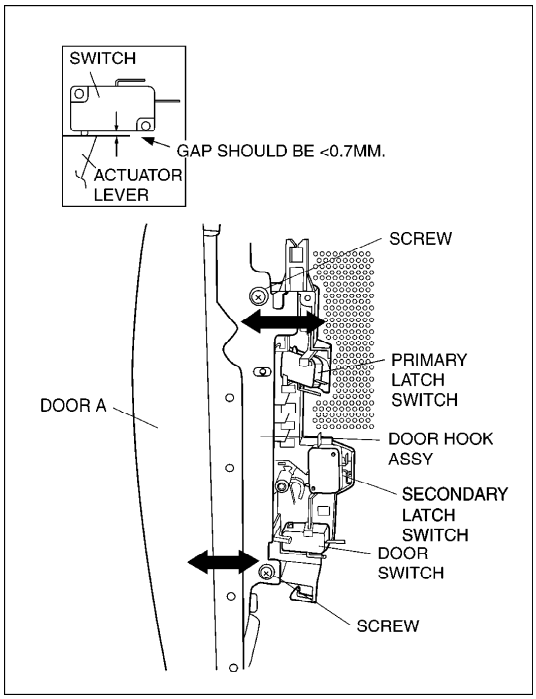
| | INPUT AMPERE | FAILURE CODE |
|---|---|---|
| Unplug CN701 | <0.4A | Oven stops in 3 seconds after started. |

If both a and b check OK, the Inverter Power Supply (U) can be determined to be OK.

# 7. MEASUREMENTS AND ADJUSTMENTS

## 7.1. Adjustment of primary latch switch, secondary latch switch and short switch.

1. Mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in ILL.
   NOTE:
   No specific individual adjustment during installation of the Primary latch switch, Secondary latch switch or short switch to the door hook are required.
2. When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of the arrows in the illustration, so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.
3. Reconnect the short switch and check the continuity of the monitor circuit and all latch switches again by following the component test procedures on .




## 7.2. Measurement of microwave output

**The output power of the magnetron can be determined by performing IEC standard test procedures. However,due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.**

**Necessary Equipment:**

***1 liter beaker *Glass thermometer / *Wrist watch or stopwatch**

**NOTE:**

**Check the line voltage under load.Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurately as possible.**

1. **Fill the beaker with exactly one liter of tap water.Stir the water using the thermometer and record the water's temperature. (recorded as T1).**
2. **Place the beaker on the center of glass tray. / Set the oven for High power and heat it for exactly one minute.**
3. **Stir the water again and read the temperature of the water. (recorded as T2).**
4. **The normal temperature rise at High power level for each model, is as shown in table.**

**TABLE (1L-1min.test)**

| RATED OUTPUT | TEMPERATURE RISE |
|---|---|
| 1000W(IEC705-88) | Min.8.6°C |

# 8. PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

**WARNING**

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm$^2$. After repairing or replacing any radiation safety device, keep a written record for future reference, the leakage reading must be recorded on the service repair ticket while in the customer's home.

## 8.1. Equipment

- Electromagnatic radiation monitor
- Glass thermometer 212 °F or 100 °C
- 600cc glass beaker

## 8.2. Procedure for measuring radiation leakage

**Note before measuring.**

- Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.
- To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area in Figure no faster than 1 inch/sec (2.5cm/sec).
- Leakage with the outer panel removed ..... less than 5mW/cm$_2$.
- Leakage for a fully assembled oven with door normally closed ..... less than 2mW/cm $_2$.
- Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door ..... less than 2mW/ cm $_2$.

1. Pour 275 ± 15cc (9ozs ± 1/2oz) of 20°C ± 5°C (68 ± 9°F) water in a beaker which is graduated to 600cc, and place in the center of the oven.
2. Set the radiation monitor to 2450MHz and use it following the manufacturer's recommended test procedure to assure correct results.
3. When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.
4. Tap the start pad or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

### 8.2.1. Measurement with the outer panel removed.

**Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.**

**WARNING**
Avoid contacting any high voltage parts.

### 8.2.2. Measurements with a fully assembled oven.

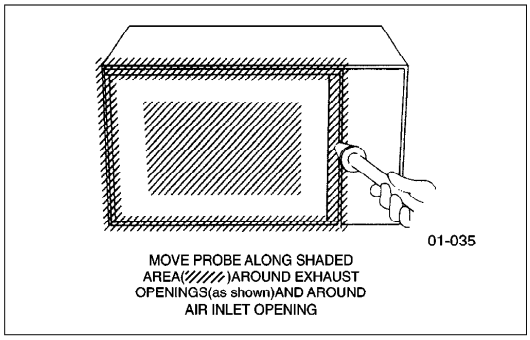
**After all components, including outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening and air inlet openings.**

## 8.3. Record keeping and notification after measurement

1. **After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.**
   **A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.**

## 8.4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.

**WARNING**
AVOID CONTACTING ANY HIGH VOLTAGE PARTS.



# 9. TROUBLESHOOTING GUIDE

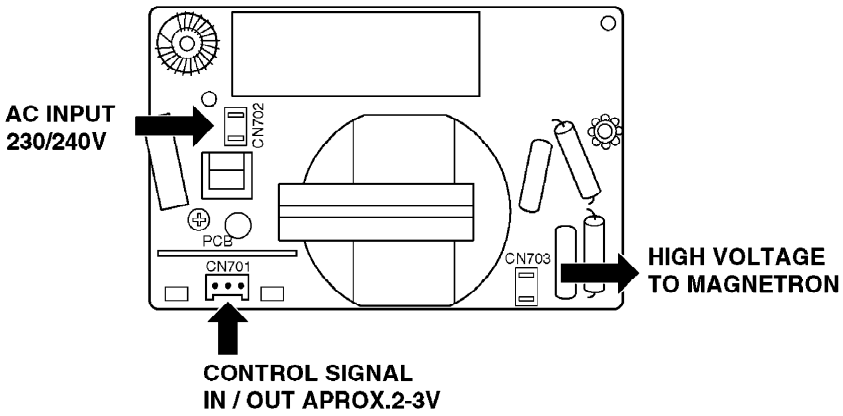
**DANGER HIGH VOLTAGES**

1. **DO NOT RE-ADJUST PRESET CONTROL on the H.V.Inverter (U). It is very dangerous to repair o without sufficient test equipment because this circuit handles very large current and high voltag Operating a misaligned inverter circuit is dangerous.**
2. **Ensure proper grounding before checking for trouble.**
3. **Be careful of the high voltage circuitry, taking necessary precautions when troubleshooting.**
4. **Discharge high voltage remains in the H.V.Inverter (U).**
5. **When checking the continuity of the switches or the H.V.Inverter, disconnect one lead wire from parts and then check continuity with the AC plug removed. To do otherwise may result in a false or damage to your meter. When disconnecting a plastic connector from a terminal, you must ho plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be op connector cannot be removed.**
6. **Do not touch any parts of the circuitry on the digital programmer circuit, since static electric dis may damage this control panel. Always touch yourself to ground while working on this panel to any static charge in your body.**
7. **230-240V AC is present on the digital programmer circuit (Terminals of power relay's and primar of Digital Programmer Circuit). When troubleshooting, be cautious of possible electrical shock h**

**Before troubleshooting, operate the microwave oven following the correct operating procedures in the instruction manual in order to find the exact cause of any trouble, since operator error may be mistaken for the oven's malfunction.**

## 9.1. (Trouble) Oven stops operation during cooking

| | SYMPTOM | CAUSE | CORRECTIONS |
|---|---|---|---|
| 1. | Oven stops in 3 seconds after pressing start pad | No 230-240V AC is supplied to H.V.Inverter (U) CN702 terminals | 1. Latch Switch<br>2. Power relay RY-1<br>3. Loose lead wire conne CN701, CN702 |
| | Oven stops in 23 seconds after pressing start pad | H.V.Inverter (U) operates by the control signals from DPC but magnetron is not oscillating | 1. Magnetron<br>2. Loose lead wire conne CN703 |
| | Oven stops in 10 seconds after pressing start pad (Auto sensor cooking) | Steam sensor circuit does not function | 1. Steam sensor<br>2. DPC<br>3. Loose wiring connecto |
| 2. | No display and no operation at all.<br>Fuse is blown. | Most probably loose connection of connectors or door latch mechanism is not adjusted properly | 1. Allign door, Door Latch<br>2. Loose wiring connecto |



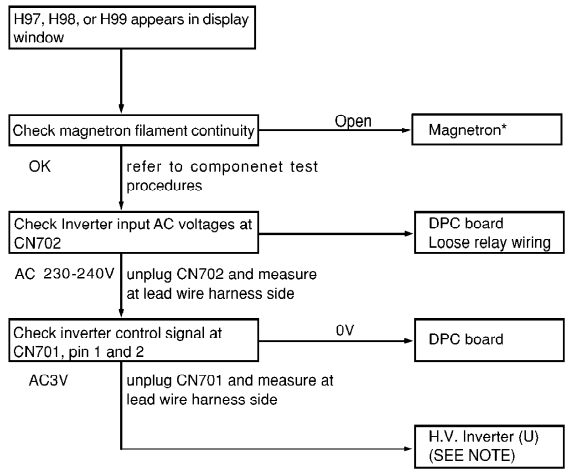

| | SYMPTOM | CAUSE | CORRECTIONS |
|---|---|---|---|
| 1. | Oven is dead.<br>Fuse is OK.<br>No display and no operation at all. | 1. Open or loose lead wire harness<br>Open thermal cutout<br>2. Open low voltage transformer<br>Defective DPC<br>3.<br><br>4. | Check fan motor if therm is defective. |
| 2. | No display and no operation at all. / Fuse is blown. | 1. Shorted lead wire harness<br>Defective primary latch switch<br>2. (NOTE 1)<br>3. Defective short switch (NOTE 1)<br>4. Defective Inverter Power Supply (U) | Check adjustment of pri secondary latch switch a switch including door. |
| | | NOTE 1:<br>All of these switches must be replaced at the same time.<br>Check continuity of power relay B (RY-1)'s contacts (between and if it has continuity, replace power relay B (RY-1) also. | |
| 3. | Oven does not accept key input(Program) | 1. Key input is not in sequence<br>Open or loose connection of<br>2. membrane key pad to DPC (Flat cable)<br>3. Shorted or open membrane key board<br>4. Defective DPC | Refer to operation proce<br><br><br><br><br>Refer to DPC troublesho |
| 4. | Fan motor turns on when oven is plugged in with door closed. | 1. Misadjustment or loose wiring of secondary latch switch<br>2. Defective secondary latch switch | Adjust door and latch sv |

| | SYMPTOM | CAUSE | CORRECTIONS |
|---|---|---|---|
| 5. | Timer starts count down but no microwave oscillation. (No heat while oven lamp and fan motor turn on) | 1. Off-alignment of latch switches<br>2. Open or loose connection of high voltage circuit especially magnetron filament circuit<br>NOTE:<br>Large contact resistance will bring lower magnetron filament voltage and cause magnetron to have lower output and/or have intermittent.<br>3. Defective high voltage component<br>H.V. Inverter Power Supply (u)<br>Magnetron<br>4. Open or loose wiring of power relay B (RY-1)<br>5. Defective primary latch switch<br>6. Defective DPC or power relay B (RY-1) | Adjust door and latch sv<br>Check high voltage com according to component procedure and replace if defective.<br>Refer to DPC troublesho |
| 6. | Oven can program but timer does not start countdown. | 1. Open or loose wiring of secondary latch switch<br>2. Off-alignment of secondary latch switch<br>3. Defective secondary latch switch | |
| 7. | Microwave output is low. Oven takes longer time to cook food. | 1. Decrease in power source voltage<br>2. Open or loose wiring of magnetron filament circuit.(Intermittent oscillation)<br>3. Aging change of magnetron | Consult electrician |
| 8. | Fan motor turns on and turntable rotates when door is opened. | 1. Shorted primary latch switch | |
| 9. | Oven does not operate and return to plugged in mode as soon as start pad is pressed. | 1. Defective DPC | Check tighten screws or escutcheon base bracke board. |
| 10. | Loud buzzing noise can be heard. | 1. Loose fan and fan motor | |
| 11. | Turntable motor does not rotate. | 1. Open or loose wiring of turntable motor<br>2. Defective turntable motor | |
| 12. | Oven stops operation during cooking. | 1. Open or loose wiring of primary and secondary latch switch<br>2. Operation of thermal cutout | Adjust door and latch sv |

| | SYMPTOM | CAUSE | CORRECTIONS |
|---|---|---|---|
| 13. | Oven returns to plugged in mode after 10 seconds elapses on the Auto sensor cooking mode. | 1. Open or loose wiring of sensor terminal from DPC<br>2. Open steam sensor<br>3. Defective DPC | |

## 9.2. Troubleshooting of inverter circuit (U) and magnetron [NEW H.V. ]

**This oven is programmed with a self diagnostics failure code system which will help for troubleshooting. H97, H98, and H99 are the provided failure codes to indicate magnetron and inverter circuit problem areas. This section explains failure codes of H97, H98, and H99. First, you must program the DPC by pressing [Clock] , [Timer] , [Start] , [Micro Power] . Program unit for operation. H97, H98, H99 appears in display window a short time after start key is pressed and there is no microwave oscillation.**

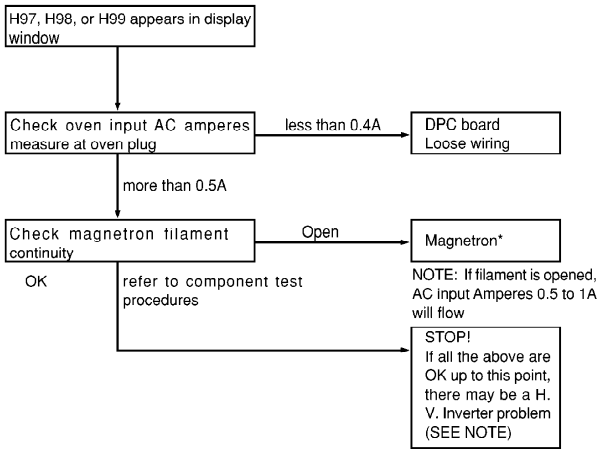

H97, H98, or H99 appears in display window
Check magnetron filament continuity
Open
Magnetron*
OK
refer to componenet test procedures
Check Inverter input AC voltages at CN702
DPC board
Loose relay wiring
AC 230-240V
unplug CN702 and measure at lead wire harness side
Check inverter control signal at CN701, pin 1 and 2
0V
DPC board
AC3V
unplug CN701 and measure at lead wire harness side
H.V. Inverter (U) (SEE NOTE)

NOTE: DO NOT try to repair this Inverter Power Supply (U) and also DO NOT RE-ADJUST PRESET CONTROL on the board. It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very high voltage and very large current. Off alignment of inverter board operation is dangerous. Operating a misaligned Inverter circuit is dangerous due to the very high voltage and current that is produced by this board. Defective boards must be replaced with a new one.

* Check magnetron filament for open or short to casing before proceeding to determine a good magnetron.

**NOTE: After check, unplug unit to reset to normal operation mode.**

**Alternate way to troubleshoot oven with AC Ampere meter used**
**H97, H98, H99 appears in display window a short time after start key is pressed and no microwave oscillation with AC Ampere meter used for troubleshooting**


H97, H98, or H99 appears in display window
Check oven input AC amperes measure at oven plug
less than 0.4A
DPC board
Loose wiring
more than 0.5A
Check magnetron filament continuity
Open
Magnetron*
OK
refer to component test procedures
NOTE: If filament is opened, AC input Amperes 0.5 to 1A will flow
STOP!
If all the above are OK up to this point, there may be a H. V. Inverter problem (SEE NOTE)

NOTE: DO NOT try to repair this Inverter Power Supply (U) and also DO NOT RE-ADJUST PRESET CONTROL on the board. It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very high voltage and very large current. Off alignment of inverter board operation is dangerous. Operating a misaligned Inverter circuit is dangerous due to the very high voltage and current that is produced by this board. Defective boards must be replaced with a new one.

* Check magnetron filament for open or short to casing before proceeding to determine a good magnetron.

**NOTE: After check, unplug unit to reset to normal operation mode.**

## 9.3. Digital programmer circuit troubleshooting guide

| SYMPTOM | STEP | CHECK | RESULT | CA CORRE |
|---|---|---|---|---|
| No display when oven is first plugged in. Oven is dead. | 1 | Fuse pattern of DPC | Normal | STEP 2 |
| | | | Open (NOTE) | Shorted of ZNR, Oven La etc.Rep |
| | 2 | Low voltage transformer (LVT) secondary voltage | Abnormal 0V | LVT |
| | | | Normal | → Step |
| | 3 | IC-1 pin 16 voltage (Emitter of Q11) | Abnormal | ZD11, Q |
| | | | Normal = 5V | Display |

**NOTE**

**Procedure of fuse pattern repairing is as follows:**

**1. When the fuse pattern (PF2) opens.**

**(1) Remove the jumper wire (PF1).**

**(2) Insert the removed jumper wire (PF1) to "(PF2)" position and solder it. If both "PF1" and "PF2 patterns are open, replace DPC.**

**2. When the fuse pattern (PF4) opens.**

**(1) Remove the jumper wire (PF3).**

**(2) Insert the removed jumper wire (PF3) to "(PF4)" position and solder it. If both "PF3" and "PF4 patterns are open, replace DPC.**

**NOTE:* At the time of these repairs, make visual inspection of the varistor for burning damage ar examine the transformer with tester for the presence of layer short-circuit (check primary coil res If any abnormal condition is detected, replace the defective parts.**

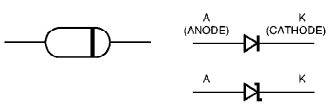
| | | | | |
|---|---|---|---|---|
| No key input | 1 | Membrane switch continuity | Abnormal | Membra |
| | | | Normal | IC-1 |
| No beep sound | 1 | IC-1 pin 29 voltage | Abnormal | IC-1 |
| | | | Normal | BZ, Q22 |
| Power relay A(RY-2) does not turn on even though the program has been set and the start pad is tapped | 1 | IC-1 pin 9 voltage while operation | Abnormal | IC-1 |
| | | | Normal = 5V | → Step |
| | 2 | Short circuit between collector and Emitter of Q223. | Still does not turn on | RY-2 |
| | | | RY-2 turns on | Q223 |
| No microwave oscillation at any power setting | 1 | IC-1 pin 7 and pin 34 voltages while operation at high power | Abnormal | IC-1 |
| | | | Normal 7---5V | → Step |
| | 2 | Q220 transistor | Abnormal | Q220 |
| | | | Normal | RY-1 |
| Dark or unclear display | 1 | Replace display and check operation | Normal | DISPLA |
| | | | Abnormal | IC-1 |

| SYMPTOM | STEP | CHECK | RESULT | CA CORRE |
|---|---|---|---|---|
| Missing or lighting of incorrect segment | 1 | Replace IC-1 and check operation | Normal | IC-1 |
| | | | Abnormal | DISPLA |
| H97/H98 appears in window and oven stops operation. Program High power for 1 minute and conduct following test quickly, unless H97/H98 appears and oven stops. [NEW H.V.] | 1 | Unplug CN702(2 pin) connector and measure voltage between terminals | 0V | 1. Latch 2. DPC/ Relay |
| | | | AC line voltage of 230-240V | → Step |
| | 2 | Unplug CN701(3 pin) connector and measure pin 1 voltage | 0V | DPC |
| | | | Approx. AC 3V | Magnet |

| CONTINUED FOR SENSOR MODELS | | | | |
|---|---|---|---|---|
| Auto sensor cooking does not operate normally. (Steam Sensor cooking does not detect steam from foods.) | 1 | Steam sensor terminal voltage by using high impedance tester (20k Ω / V),while breathing on metal surface of sensor | Abnormal = 0V | Steam senso |
| | | | Normal>10-30mV | IC-1 |

## 9.4. How to check the semiconductors using an OHM meter

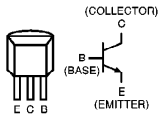
**Diode**




| | FORWARD | REVERSE |
|---|---|---|
| A-K | SMALL | ∞ |

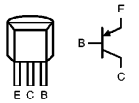
**Transistor**

NPN Transistor
2SC·····
2SD·····



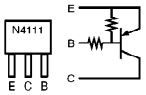

| | FORWARD | REVERSE |
|---|---|---|
| B-E | SMALL | ∞ |
| B-C | SMALL | ∞ |
| C-E | ∞ | ∞ |

PNP Transistor
2SA·····
2SB·····



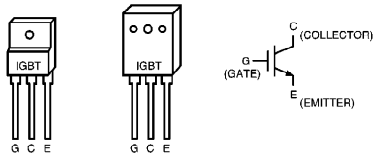

| | FORWARD | REVERSE |
|---|---|---|
| B-E | SMALL | ∞ |
| C-B | SMALL | ∞ |
| C-E | ∞ | ∞ |

**Digital Transistor**
**PNP Transistor**



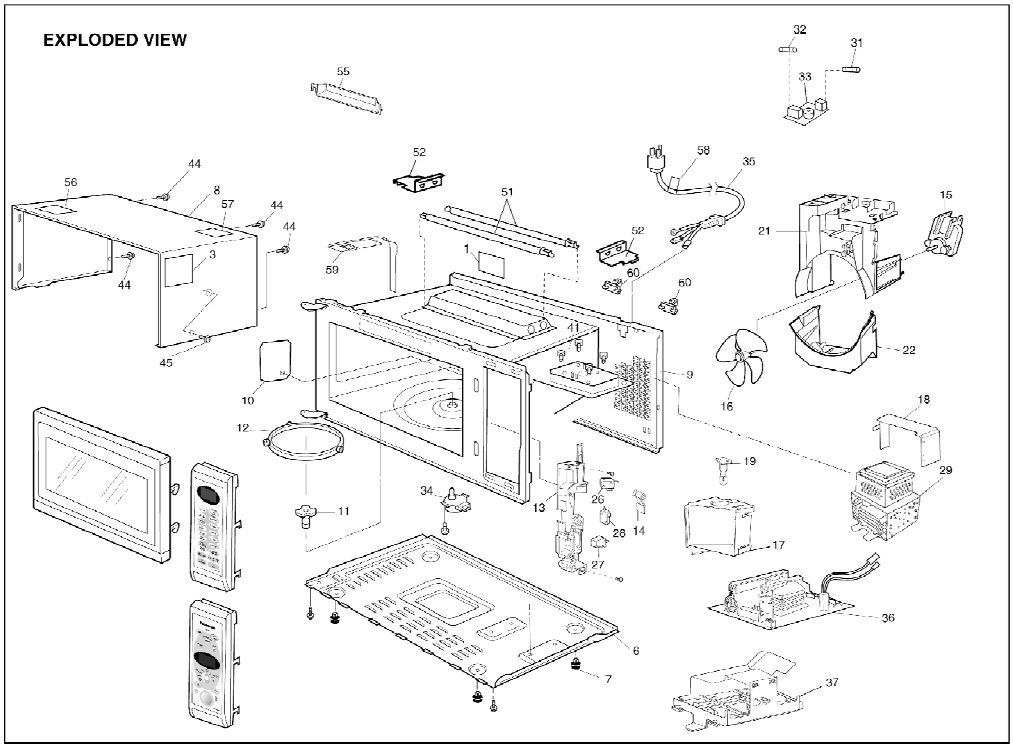

| | FORWARD | REVERSE |
|---|---|---|
| E-B | 10kΩ ~ 30kΩ | 10kΩ ~ 30kΩ |
| C-B | 50kΩ ~ 90kΩ | ∞ |
| C-E | 40kΩ ~ 80kΩ | ∞ |

**IGBT**
**(INSULATED GATE BIPOLAR TRANSISTOR)**




| | FORWARD | REVERSE |
|---|---|---|
| E-C | SMALL | ∞ |
| E-G | ∞ | ∞ |
| C-G | ∞ | ∞ |

# 10. EXPLODED VIEW AND PARTS LIST




# 11. PARTS LIST

**NOTE:**

1. **When ordering replacement part(s), please use part number(s) shown in this part list.**
   **Do not use description of the part.**
2. **Important safety notice:**
   **Components identified by ⚠ mark have special characteristics important for safety.**
   **When replacing any of these components, use only manufacture's specified parts.**

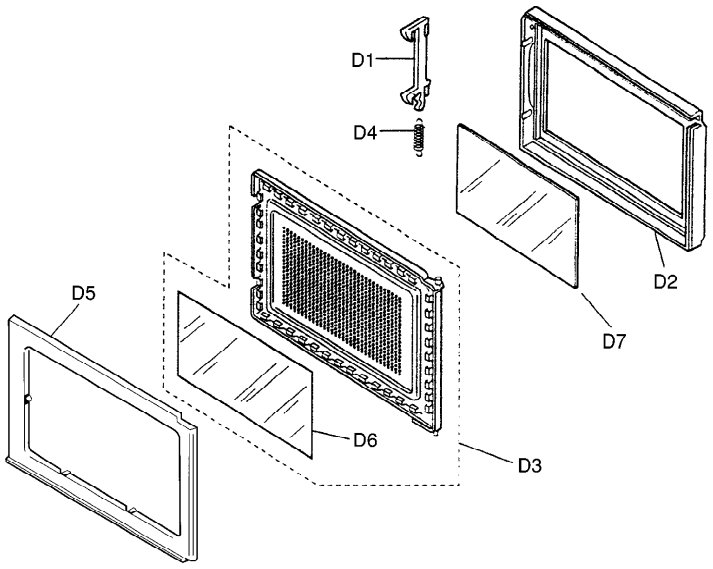
**NOTE:**

**Please order all parts from MELUK in U.K.**

| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| 1 | | F00064080BP | CAUTION LABEL | 1 | BPQ |
| 1 | | F00069000EP | CAUTION LABEL | 1 | GPG, EPG |
| 3 | | F04905R80HEP | ENERGY LABEL | 1 | F663WF EPG |
| 3 | | F04905R80SEP | ENERGY LABEL | 1 | F623MF EPG |
| 3 | | F04905R70HEP | ENERGY LABEL | 1 | F653WF EPG |
| 3 | | F04906A00HEP | ENERGY LABEL | 1 | Q553WF EPG |
| 3 | | F04905Q90SEP | ENERGY LABEL | 1 | Q523MF EPG |
| 3 | | F04905Q50HEP | ENERGY LABEL | 1 | Q543WF EPG |
| | | | | | |
| 6 | | F10015Q00AP | BASE | 1 | |
| 7 | | F10084T00AP | RUBBER FOOT | 4 | |
| 8 | | F110D5R00HAP | CABINET BODY | 1 | V***WF, F***WF |
| 8 | | F110D5R00SAP | CABINET BODY | 1 | V***MF, F***MF |
| 8 | | F110D5R00CBP | CABINET BODY | 1 | V***CF |
| 8 | | F110D5Q00SAP | CABINET BODY | 1 | T***MF, Q***MF |
| 8 | | F110D5Q00HAP | CABINET BODY | 1 | T***WF, Q***WF |
| 9 | ⚠ | F200A5R60BP | OVEN | 1 | V653 BPQ/GPG, V623 BPQ/GPG, F663 EPG, / F653 EPG, F623 EPG |
| 9 | ⚠ | F200A5R20BP | OVEN | 1 | V453WF, V423MF |
| 9 | ⚠ | F200A5Q70BP | OVEN | 1 | T553WF BPQ, T523MF BPQ, Q553WF EPG, Q523MF EPG |
| 9 | ⚠ | F200A5Q30BP | OVEN | 1 | T543WF BPQ, Q543WF EPG |
| 10 | | F20555Q00BP | COVER | 1 | |
| | | | | | |
| 11 | | F21314Y00XN | PULLY SHAFT | 1 | |
| 12 | | F290D5Q00AP | ROLLER RING (U) | 1 | |
| 13 | ⚠ | F30205Q00AP | DOOR HOOK | 1 | |
| 14 | | F31365Q00AP | HOOK LEVER A | 1 | |
| 15 | | F400A5U00XN | FAN MOTOR | 1 | |
| | | | | | |
| 16 | | F40085G10XN | FAN BLADE | 1 | |
| 17 | | F40255Q00AP | AIR GUIDE A | 1 | |
| 18 | | F40425Q00AP | AIR GUIDE F | 1 | |
| 19 | | F612E5G10XN | INCANDESCENT LAMP (U) | 1 | (20W/240V) |
| | | | | | |
| 21 | | F41445Q00AP | UPPER ORIFICE | 1 | |
| 22 | | F42095Q00AP | LOWER ORIFICE | 1 | |
| | | | | | |
| 26 | ⚠ | J61415G10XN | MICRO SWITCH | 1 | V-15G-3C25 (PRIMARY LATCH SWITCH) |
| 27 | ⚠ | F61415U30XN | MICRO SWITCH | 1 | KW3-0D-A(474) (SECONDARY LATCH SWITCH) |
| 28 | ⚠ | F61785U30XN | MICRO SWITCH | 1 | KW3-0T-A(375) (SHORT SWITCH) |
| 29 | ⚠ | 2M236-M42G | MAGNETRON | 1 | |
| | | | | | |
| 31 | ⚠ | A62304210BP | FUSE | 1 | (10A) |
| 32 | ⚠ | B62304000AP | FUSE | 1 | V*** BPQ, V*** GPG, F***EPG (15A) |
| 33 | | J607X4L00BP | NOISE FILTER (U) | 1 | T*** BPQ, Q*** EPG |
| 33 | | J607X5R60BP | NOISE FILTER (U) | 1 | V*** BPQ, V*** GPG, F*** EPG |
| 34 | | F63265U30XN | TURNTABLE MOTOR | 1 | |
| 35 | ⚠ | F900C5G50BP | AC CORD W/PLUG | 1 | T*** BPQ |
| 35 | ⚠ | F900C5G10TN | AC CORD W/PLUG | 1 | Q*** EPG |
| 35 | ⚠ | F900C5R00BP | AC CORD W/PLUG | 1 | V*** BPQ |
| 35 | ⚠ | F900C5R00EP | AC CORD W/PLUG | 1 | V*** GPG, F*** EPG |
| | | | | | |

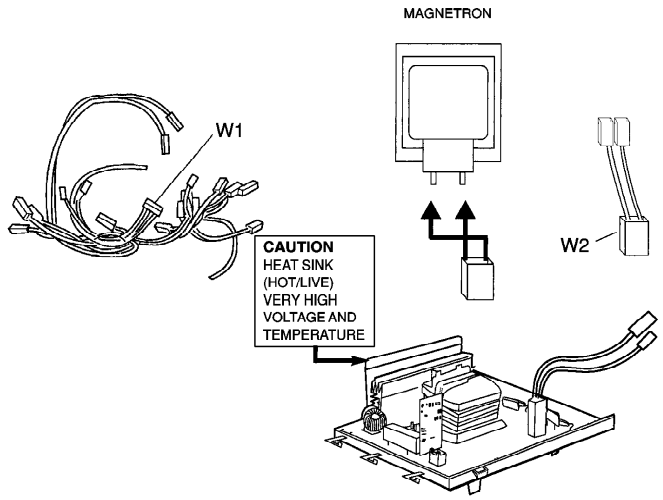
| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| 36 | | F606Y4V00BP | H.V.INVERTER (U) | 1 | |
| 37 | | F65855R00BP | INVERTER BRACKET | 1 | |
| | | | | | |
| 41 | | XTWFA4+12T | SCREW | 4 | FOR MAGNETRON |
| 44 | | XTWFA4+12D | SCREW | 4 | FOR CABINET BODY |
| 45 | | XTCAFA4+ 12AFS | SCREW | 1 | V***MF, F***MF, T***MF, Q***MF / (FOR CABINET BODY SIDE) |
| 45 | | XTCAFA4+ 12AFW | SCREW | 1 | V***WF, F***WF, T***WF, Q***WF / (FOR CABINET BODY SIDE) |
| 45 | | XTCAFA4+ 12AFC | SCREW | 1 | V***CF (FOR CABINET BODY SIDE) |
| | | | | | |
| 51 | | F630G5R20BP | HEATER (AU) | 2 | V653WF/CF BPQ, V623MF BPQ (650W, 120V) |
| 51 | | F630G5R20GP | HEATER (AU) | 2 | V653WF/CF GPG, V623MF GPG, F*** EPG (650W, 120V) |
| 51 | | F630G5R00BP | HEATER (AU) | 2 | V453WF BPQ (550W, 120V) |
| 51 | | F630G5U00XN | HEATER (AU) | 2 | V453WF GPG, V423MF GPG (550W, 120V) |
| 52 | | F64605R00BP | HEATER MOUNTING PLATE | 2 | V*** BPQ, V*** GPG, F*** EPG |
| 55 | | F40245R00BP | EXHAUST GUIDE A | 1 | V*** BPQ, V*** GPG, F*** EPG |
| | | | | | |
| 56 | | F01505R00BP | NO TOUCHING LABEL | 1 | V***MF/WF BPQ |
| 56 | | F01505R20BP | NO TOUCHING LABEL | 1 | V***CF BPQ |
| 57 | | F01505R00GP | NO TOUCHING LABEL | 1 | V***WF/MF GPG |
| 57 | | F01505R20GP | NO TOUCHING LABEL | 1 | V***CF GPG |
| 57 | | F01505R00EP | NO TOUCHING LABEL | 1 | F***WF/MF EPG |
| 58 | | F02395G50BP | AC CORD CAUTION LABEL | 1 | BPQ |
| 59 | | F62865Q00BP | HEAT SHIELD | 1 | |
| 60 | | F11404J60XN | STOPPER | 2 | |

# 12. DOOR ASSEMBLY



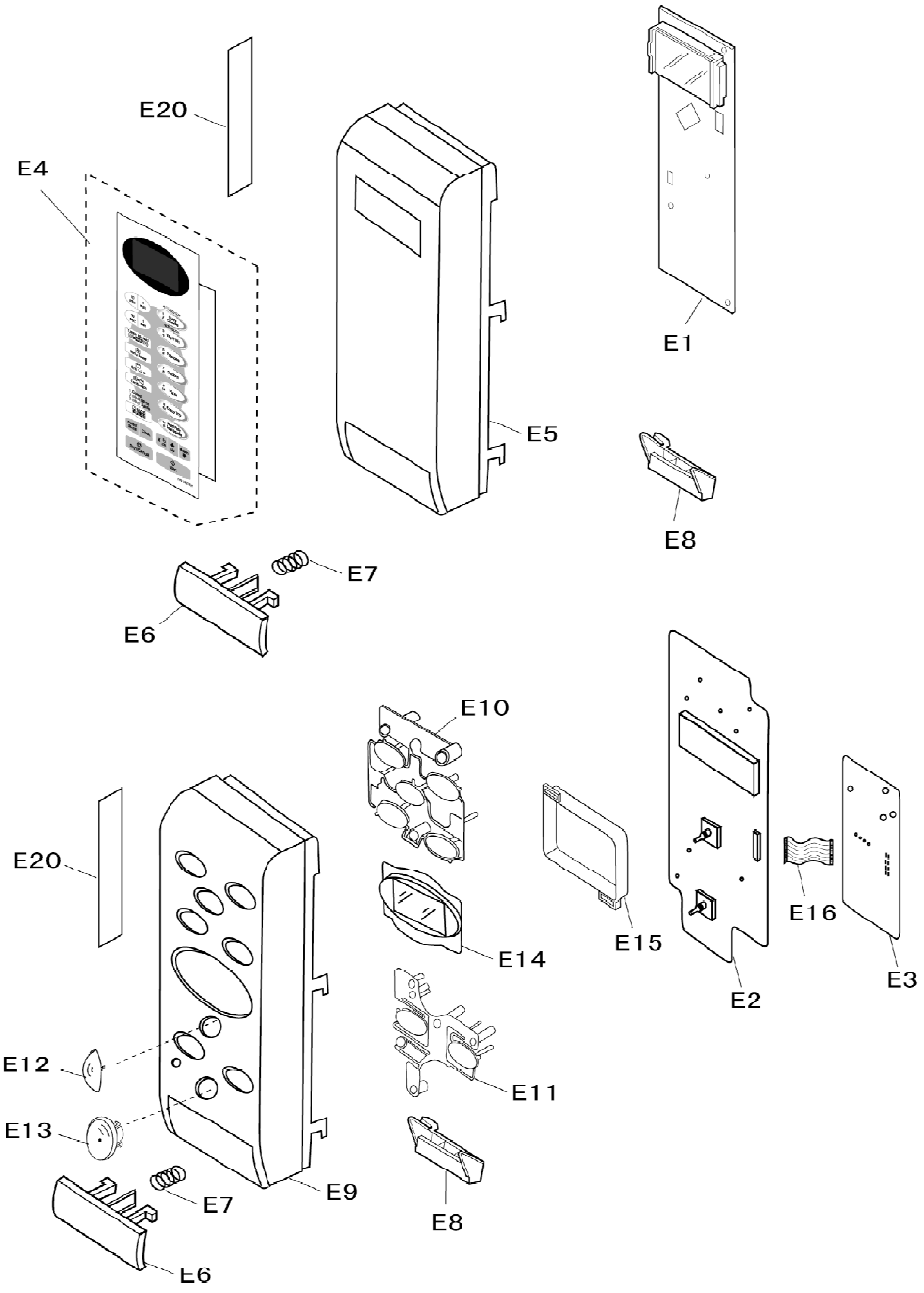
| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| D1 | | F30185Q00AP | DOOR KEY A | 1 | |
| D2 | ⚠ | F30015Q00HBP | DOOR A | 1 | T***WF, Q***WF, V***WF, F***WF |
| D2 | ⚠ | F30015Q00SBP | DOOR A | 1 | T***MF, Q***MF, V***MF, F***MF |
| D2 | ⚠ | F30015Q00CBP | DOOR A | 1 | V***CF |
| D3 | ⚠ | F301P5R00AP | DOOR E (U) | 1 | V*** BPQ, V*** GPG, F*** EPG |
| D3 | ⚠ | F302K5Q00AP | DOOR E (U) | 1 | T*** BPQ, Q*** EPG |
| D4 | | F30215G10XN | DOOR KEY SPRING | 1 | |
| D5 | ⚠ | F30855Q00AP | DOOR C | 1 | |
| | | | | | |
| D6 | | F31454T00AP | DOOR SCREEN A | 1 | T*** BPQ, Q*** EPG |
| D7 | | F31465R00BP | DOOR SCREEN B | 1 | V*** BPQ |
| D7 | | F31465R00EP | DOOR SCREEN B | 1 | V*** GPG, F*** EPG |
| D7 | | F31465Q00BP | DOOR SCREEN B | 1 | T*** BPQ |
| D7 | | F31465Q00EP | DOOR SCREEN B | 1 | Q*** EPG |

# 13. WIRING MATERIALS




| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| W1 | | F030A5R00BP | LEAD WIRE HARNESS | 1 | V*** BPQ, V*** GPG, F*** EPG |
| W1 | | F030A5Q00BP | LEAD WIRE HARNESS | 1 | T*** BPQ, Q*** EPG |
| W2 | | F030E5Q00AP | H.V.LEAD WIRE | 1 | |

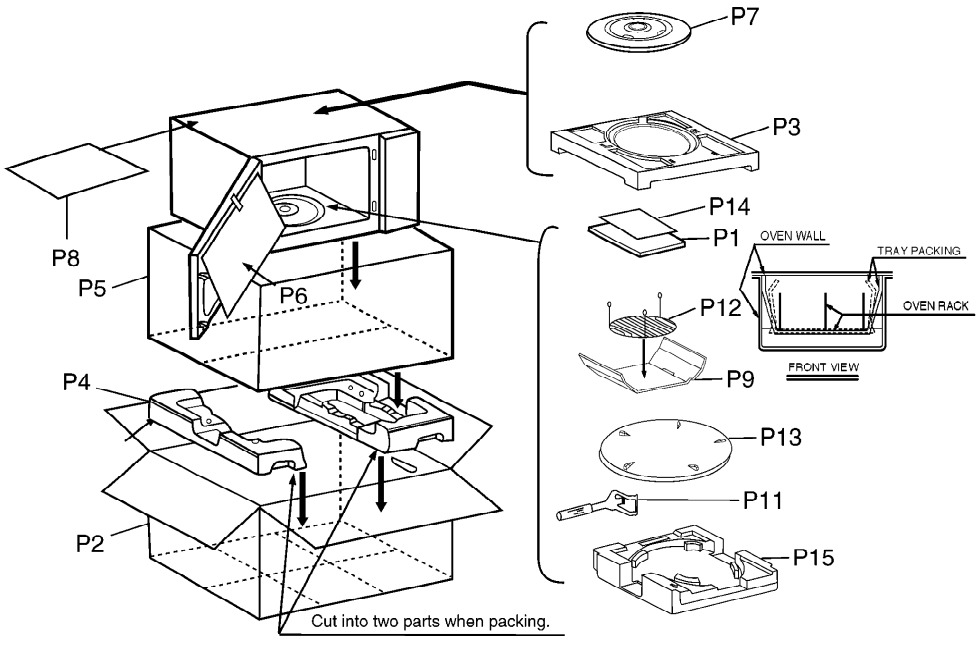
# 14. ESCUTCHEON BASE ASSEMBLY


E20
E4
E5
E1
E8
E7
E6
E10
E20
E14
E15
E16
E3
E2
E12
E11
E13
E9
E7
E8
E6

| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| E1 | | F603L5R60BP | D.P.CIRCUIT (AU) | 1 | V653WF/CF BPQ, V623MF BPQ |
| E1 | | F603L5R60GP | D.P.CIRCUIT (AU) | 1 | V653WF/CF GPG, V623MF GPG |
| E1 | | F603L5R20BP | D.P.CIRCUIT (AU) | 1 | V453WF BPQ |
| E1 | | F603L5R20GP | D.P.CIRCUIT (AU) | 1 | V453WF GPG, V423MF GPG |
| E1 | | F603L5Q70BP | D.P.CIRCUIT (AU) | 1 | T553WF BPQ, T523MF BPQ |
| E1 | | F603L5Q30BP | D.P.CIRCUIT (AU) | 1 | T543WF BPQ |
| E2 | | F608E5R80EP | D.P.CIRCUIT (ABU) | 1 | F663WF EPG, F623MF EPG |
| E2 | | F608E5R70EP | D.P.CIRCUIT (ABU) | 1 | F653WF EPG |
| E2 | | F608E5Q90EP | D.P.CIRCUIT (ABU) | 1 | Q553WF EPG, Q523MF EPG |
| E2 | | F608E5Q50EP | D.P.CIRCUIT (ABU) | 1 | Q543WF EPG |
| E3 | | F603Y5R80EP | D.P.CIRCUIT (DU) | 1 | F663WF EPG, F653WF EPG, F623MF EPG |
| E3 | | F603Y5Q90EP | D.P.CIRCUIT (DU) | 1 | Q553WF EPG, Q523MF EPG, Q543WF EPG |
| E4 | | F630Y5R60HBP | MEMBRANE SWITCH (U) | 1 | V653WF BPQ |
| E4 | | F630Y5R60CBP | MEMBRANE SWITCH (U) | 1 | V653CF BPQ |
| E4 | | F630Y5R60SBP | MEMBRANE SWITCH (U) | 1 | V623MF BPQ |
| E4 | | F630Y5R60HGP | MEMBRANE SWITCH (U) | 1 | V653WF GPG |
| E4 | | F630Y5R60CGP | MEMBRANE SWITCH (U) | 1 | V653CF GPG |
| E4 | | F630Y5R60SGP | MEMBRANE SWITCH (U) | 1 | V623MF GPG |
| E4 | | F630Y5R20HBP | MEMBRANE SWITCH (U) | 1 | V453WF BPQ |
| E4 | | F630Y5R20HGP | MEMBRANE SWITCH (U) | 1 | V453WF GPG |
| E4 | | F630Y5R20SGP | MEMBRANE SWITCH (U) | 1 | V423MF GPG |
| E4 | | F630Y5Q80HBP | MEMBRANE SWITCH (U) | 1 | T553WF BPQ |
| E4 | | F630Y5Q70SBP | MEMBRANE SWITCH (U) | 1 | T523MF BPQ |
| E4 | | F630Y5Q30HBP | MEMBRANE SWITCH (U) | 1 | T543WF BPQ |
| E5 | | F80345Q00HBP | ESCUTCHEON BASE | 1 | V653WF BPQ, V653WF GPG, V453WF BPQ, V453WF GPG, T553WF BPQ, T543WF BPQ |
| E5 | | F80345Q00SBP | ESCUTCHEON BASE | 1 | V623MF BPQ, V623MF GPG, V423MF GPG, T523MF BPQ |
| E5 | | F80345Q00CBP | ESCUTCHEON BASE | 1 | V653CF BPQ, V653CF GPG |
| | | | | | |
| E6 | | F80725Q00HAP | DOOR OPENING BUTTON | 1 | V***WF, F***WF, T***WF, Q***WF |
| E6 | | F80725Q00SAP | DOOR OPENING BUTTON | 1 | V***MF, F***MF, T***MF, Q***MF |
| E6 | | F80725Q00CBP | DOOR OPENING BUTTON | 1 | V***CF |
| E7 | | F80375K00AP | COOK BUTTON SPRING | 1 | |
| E8 | | F82565Q00AP | DOOR OPENING LEVEL | 1 | |
| E9 | | F80345R80HEP | ESCUTCHEON BASE | 1 | F663WF EPG |
| E9 | | F80345R70HEP | ESCUTCHEON BASE | 1 | F653WF EPG |
| E9 | | F80345R80SEP | ESCUTCHEON BASE | 1 | F623MF EPG |
| E9 | | F80346A00HEP | ESCUTCHEON BASE | 1 | Q553WF EPG |
| E9 | | F80345Q90SEP | ESCUTCHEON BASE | 1 | Q523MF EPG |
| E9 | | F80345Q50HEP | ESCUTCHEON BASE | 1 | Q543WF EPG |
| E10 | | F80245R80HEP | BUTTON A | 1 | F663WF EPG, F653WF EPG |
| E10 | | F80245R80SEP | BUTTON A | 1 | F623MF EPG |
| E10 | | F80245Q50HEP | BUTTON A | 1 | Q553WF EPG, Q543WF EPG |
| E10 | | F80245Q50BEP | BUTTON A | 1 | Q523MF EPG |
| | | | | | |
| E11 | | F83875Q50HEP | BUTTON B | 1 | F663WF EPG, F653WF EPG, Q553WF EPG, Q543WF EPG |
| E11 | | F83875Q50BEP | BUTTON B | 1 | F623MF EPG, Q523MF EPG |
| E12 | | F80205Q50HEP | KNOB A | 1 | F663WF EPG, F653WF EPG, Q553WF EPG, Q543WF EPG |
| E12 | | F80205Q50SEP | KNOB A | 1 | F623MF EPG, Q523MF EPG |
| E13 | | F83925Q50HEP | KNOB B | 1 | F663WF EPG, F653WF EPG, Q553WF EPG, Q543WF EPG |
| E13 | | F83925R80SEP | KNOB B | 1 | F623MF EPG, Q523MF EPG |
| E14 | | F81895Q50HEP | DISPLAY WINDOW | 1 | F663WF EPG, F653WF EPG, F623MF EPG, Q553WF EPG, Q543WF EPG, Q523MF EPG |

| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| E15 | | F80165Q50EP | DISPLAY FRAME | 1 | F663WF EPG, F653WF EPG, F623MF EPG, Q553WF EPG, Q543WF EPG, Q523MF EPG |
| | | | | | |
| E16 | | F66165Q00EP | FLAT CABLE | 1 | F663WF EPG, F653WF EPG, F623MF EPG, Q553WF EPG, Q543WF EPG, Q523MF EPG |
| E20 | | F00075R70HBP | NAME PLATE | 1 | V653WF BPQ |
| E20 | | F00075R70CBP | NAME PLATE | 1 | V653CF BPQ |
| E20 | | F00075R60SBP | NAME PLATE | 1 | V623MF BPQ |
| E20 | | F00075R60HGP | NAME PLATE | 1 | V653WF GPG |
| E20 | | F00075R60CGP | NAME PLATE | 1 | V653CF GPG |
| E20 | | F00075R60SGP | NAME PLATE | 1 | V623MF GPG |
| E20 | | F00075R80HEP | NAME PLATE | 1 | F663WF EPG |
| E20 | | F00075R70HEP | NAME PLATE | 1 | F653WF EPG |
| E20 | | F00075R80SEP | NAME PLATE | 1 | F623MF EPG |
| E20 | | F00075R20HBP | NAME PLATE | 1 | V453WF BPQ |
| E20 | | F00075R20HGP | NAME PLATE | 1 | V453WF GPG |
| E20 | | F00075R20SGP | NAME PLATE | 1 | V423MF GPG |
| E20 | | F00075Q80HBP | NAME PLATE | 1 | T553WF BPQ |
| E20 | | F00075Q70SBP | NAME PLATE | 1 | T523MF BPQ |
| E20 | | F00076A00HEP | NAME PLATE | 1 | Q553WF EPG |
| E20 | | F00075Q90SEP | NAME PLATE | 1 | Q523MF EPG |
| E20 | | F00075Q30HBP | NAME PLATE | 1 | T543WF BPQ |
| E20 | | F00075Q50HEP | NAME PLATE | 1 | Q543WF EPG |

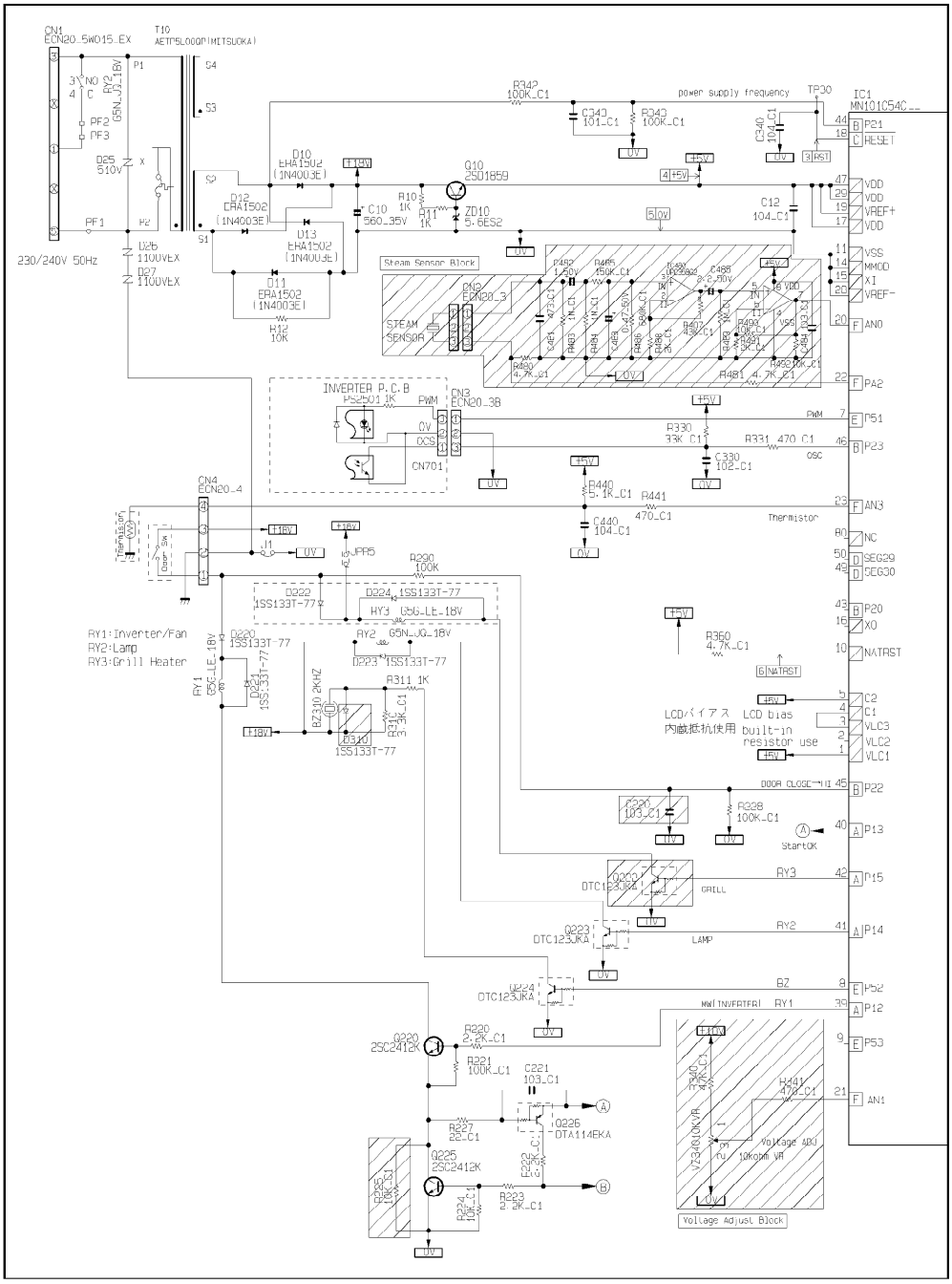
# 15. PACKING AND ACCESORIES

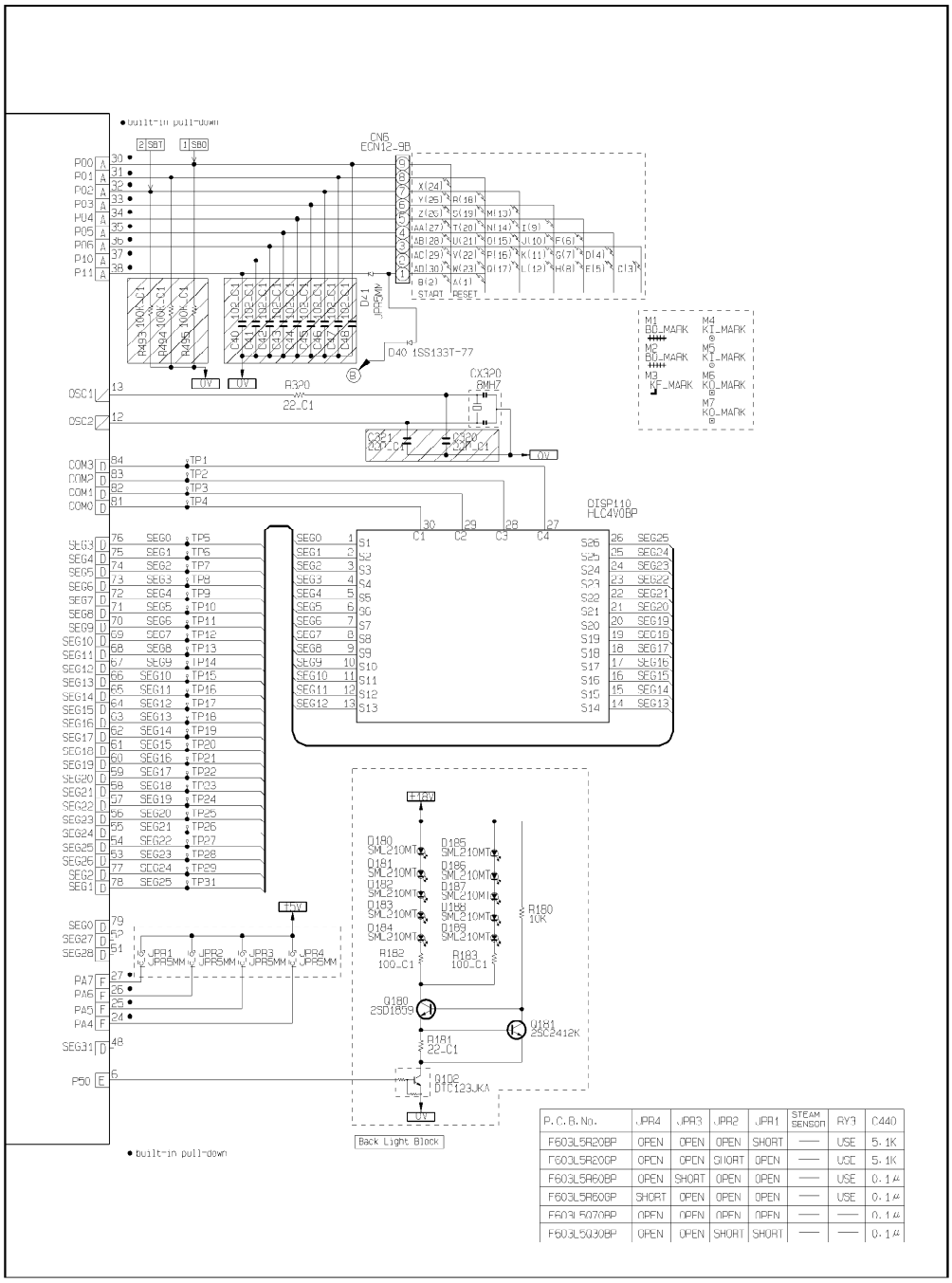


| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| P1 | | F00035R20BP | INSTRUCTION MANUAL | 1 | V*** BPQ |
| P1 | | F00035R20GP | INSTRUCTION MANUAL | 1 | V*** GPG |
| P1 | | F00035Q50EP | INSTRUCTION MANUAL | 1 | F*** EPG, Q*** EPG |
| P1 | | F00035Q30BP | INSTRUCTION MANUAL | 1 | T*** BPQ |
| P2 | | F01025R70HBP | PACKING CASE, PAPER | 1 | V653WF BPQ |
| P2 | | F01025R70CBP | PACKING CASE, PAPER | 1 | V653CF BPQ |
| P2 | | F01025R60SBP | PACKING CASE, PAPER | 1 | V623MF BPQ |
| P2 | | F01025R60HGP | PACKING CASE, PAPER | 1 | V653WF GPG |
| P2 | | F01025R60CGP | PACKING CASE, PAPER | 1 | V653CF GPG |
| P2 | | F01025R60SGP | PACKING CASE, PAPER | 1 | V623MF GPG |
| P2 | | F01025R80HEP | PACKING CASE, PAPER | 1 | F663WF EPG |
| P2 | | F01025R70HEP | PACKING CASE, PAPER | 1 | F653WF EPG |
| P2 | | F01025R80SEP | PACKING CASE, PAPER | 1 | F623MF EPG |
| P2 | | F01025R20HBP | PACKING CASE, PAPER | 1 | V453WF BPQ |
| P2 | | F01025R20HGP | PACKING CASE, PAPER | 1 | V453WF GPG |
| P2 | | F01025R20SGP | PACKING CASE, PAPER | 1 | V423MF GPG |
| P2 | | F01025Q80HBP | PACKING CASE, PAPER | 1 | T553WF BPQ |
| P2 | | F01025Q70SBP | PACKING CASE, PAPER | 1 | T523MF BPQ |
| P2 | | F01026A00HEP | PACKING CASE, PAPER | 1 | Q553WF EPG |
| P2 | | F01025Q90SEP | PACKING CASE, PAPER | 1 | Q523MF EPG |
| P2 | | F01025Q30HBP | PACKING CASE, PAPER | 1 | T543WF BPQ |
| P2 | | F01025Q50HEP | PACKING CASE, PAPER | 1 | Q543WF EPG |
| P3 | | F01045Q00AP | UPPER FILLER | 1 | |
| P4 | | F01055Q00AP | LOWER FILLER | 1 | |
| P5 | | F01068100XN | P.E.BAG | 1 | |
| | | | | | |
| P6 | | F01078100XN | DOOR SHEET | 1 | |
| P7 | | F06015Q00AP | COOKING TRAY | 1 | |
| P8 | | F01924T00AP | SHEET | 1 | V***MF, V***CF, F***MF, T***MF, Q***MF |
| P9 | | F01085R00AP | RACK PACKING | 1 | V*** BPQ, V*** GPG, F653WF EPG |
| P9 | | F01085R00BP | RACK PACKING | 1 | F663WF EPG, F623MF EPG |
| | | | | | |
| P11 | | F10855R00BP | PIZZA PAN HANDLE | 1 | F663WF EPG, F623MF EPG |
| P12 | | F060V5R00BP | OVEN RACK | 1 | V*** BPQ |
| P12 | | F060V5U00XN | OVEN RACK | 1 | V*** GPG, F*** EPG |
| P13 | | F46065R00BP | PIZZA PAN | 1 | F663WF EPG, F623MF EPG |
| P14 | | F01695M70BP | SERVICE CENTER LIST | 1 | |
| P15 | | F01135R00AP | PIZZA PAN FOAM | 1 | F663WF EPG, F623MF EPG |

# 16. DIGITAL PROGRAMMER CIRCUIT (BPQ & GPG MODELS)

## SCHEMATIC DIAGRAM

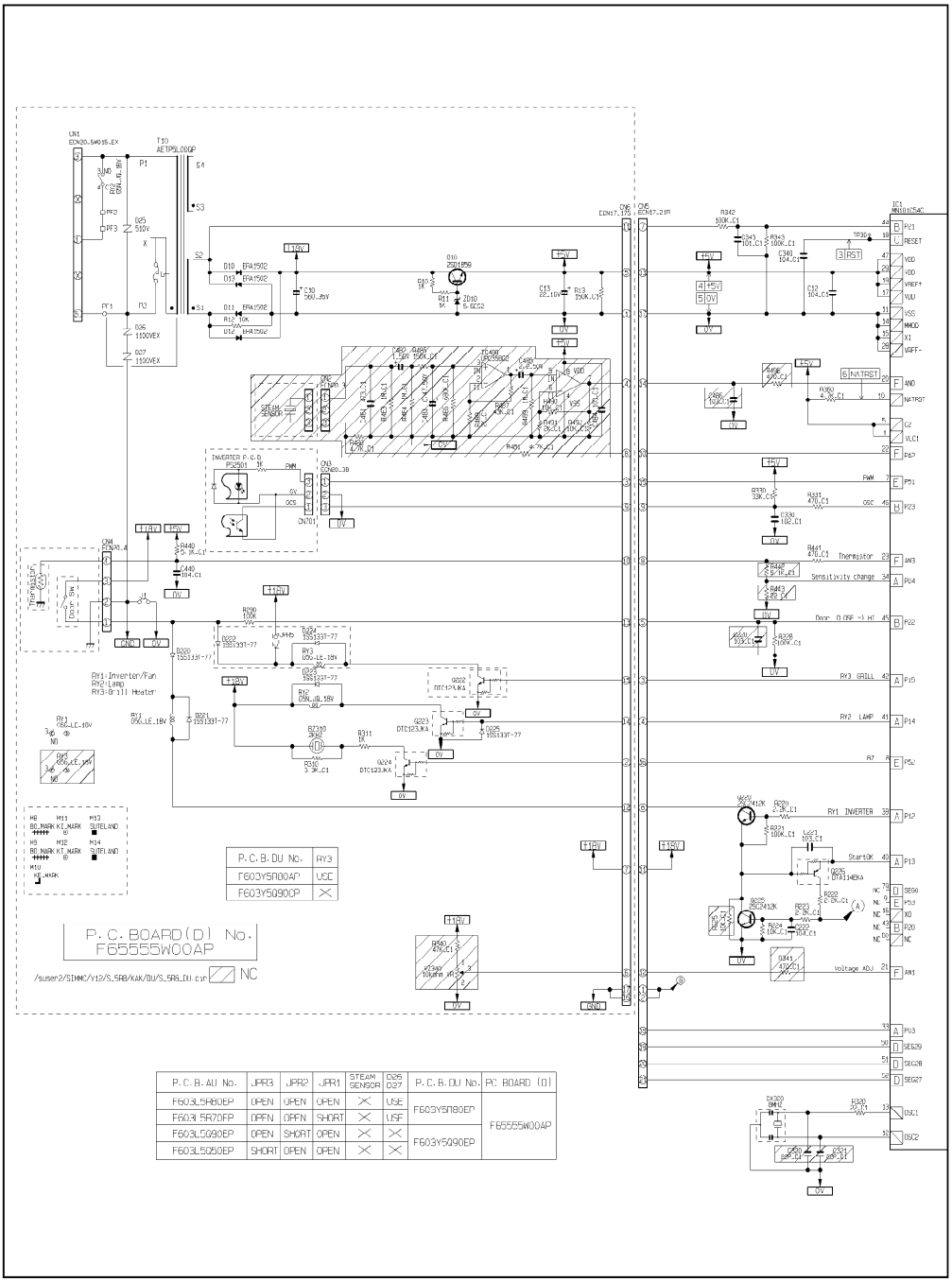

CN1
ECN20_5W015_EX
T10
AETMSL000M(MITSUOKA)
230/240V 50Hz
power supply frequency
TP30
IC1
MN101C54C__
Steam Sensor Block
STEAM SENSOR
CN2
ECN20_3
INVERTER P.C.B
CN3
ECN20_3B
CN701
CN4
ECN20_4
Thermistor
Door SW
RY1:Inverter/Fan
RY2:Lamp
RY3:Grill Heater
LCDバイアス
内蔵抵抗使用
LCD bias
built-in
resistor use
DOOR CLOSE
StartOK
GRILL
LAMP
MW(INVERTER)
Voltage ADJ
10kohm VR
Voltage Adjust Block
Thermistor
OSC
PWM
NATRST
VDD
VSS
MMOD
XI
XO
VREF+
VREF-
AN0
AN1
AN3
PA2
P51
P23
P20
P21
RESET
SEG29
SEG30
C2
C1
VLC3
VLC2
VLC1
P22
P13
P15
P14
P52
P12
P53




| P.C.B.No. | JPR4 | JPR3 | JPR2 | JPR1 | STEAM SENSOR | RY1 | C440 |
|---|---|---|---|---|---|---|---|
| F603L5R20BP | OPEN | OPEN | OPEN | SHORT | —— | USE | 5.1K |
| F603L5R20CP | OPEN | OPEN | SHORT | OPEN | —— | USE | 5.1K |
| F603L5R60BP | OPEN | SHORT | OPEN | OPEN | —— | USE | 0.1μ |
| F603L5R60CP | SHORT | OPEN | OPEN | OPEN | —— | USE | 0.1μ |
| F603L5Q70BP | OPEN | OPEN | OPEN | OPEN | —— | —— | 0.1μ |
| F603L5Q90BP | OPEN | OPEN | SHORT | SHORT | —— | —— | 0.1μ |

# 17. DIGITAL PROGRAMMER CIRCUIT (EPG MODELS)

**SCHEMATIC DIAGRAM**

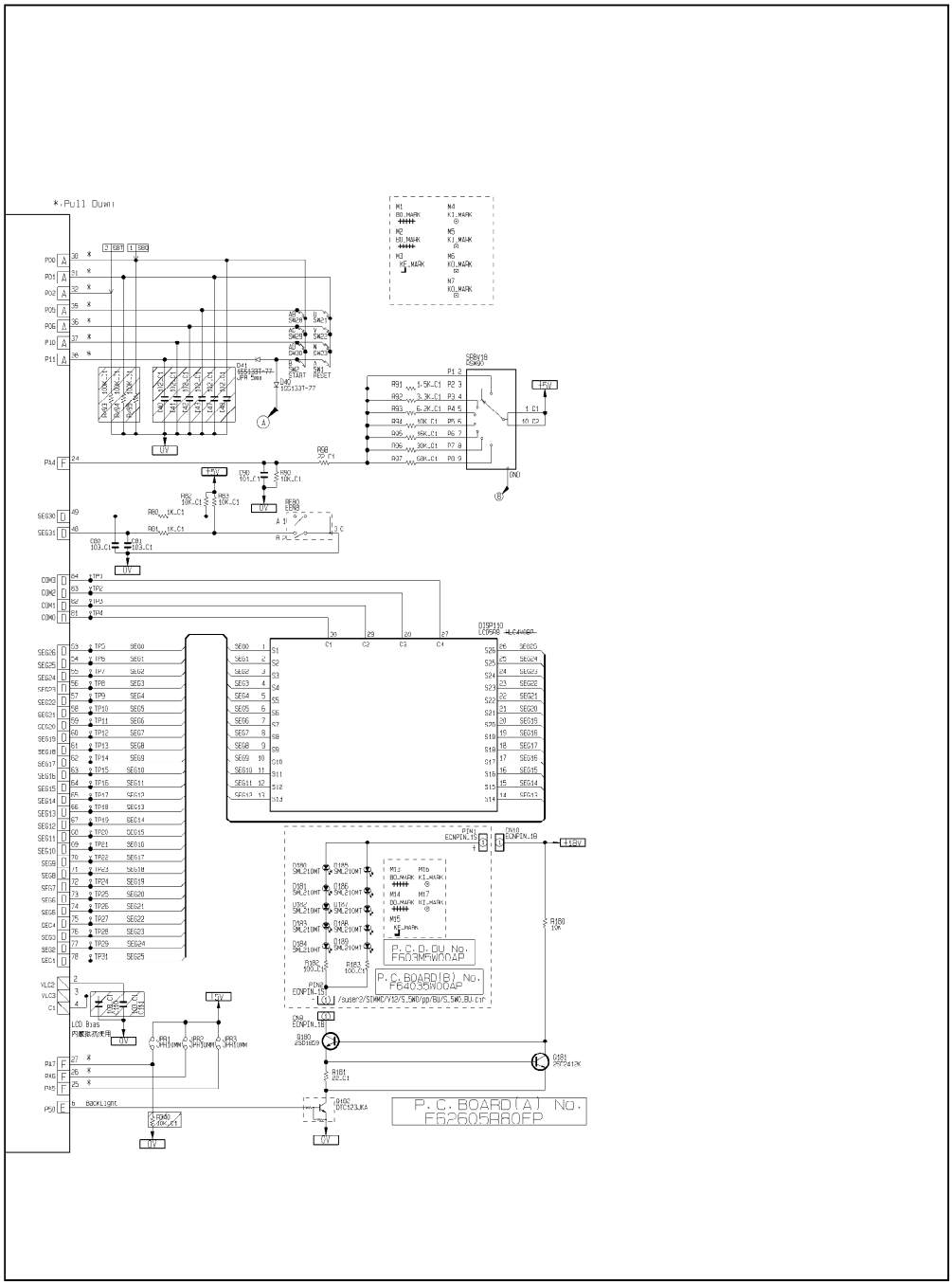


| P.C.B.DU No. | RY3 |
|---|---|
| F603Y5080AP | USE |
| F603Y5090EP | ✕ |

P. C. BOARD(D) No.
F65555W00AP

/suser2/SIMMC/Y12/S_5AB/KAK/DU/S_5AB_DU.cir ✕ NC

| P.C.B.AU No. | JPR3 | JPR2 | JPR1 | STEAM SENSOR | D26 D27 | P.C.B.DU No. | PC BOARD (D) |
|---|---|---|---|---|---|---|---|
| F603L5AB0EP | OPEN | OPEN | OPEN | ✕ | USE | F603Y5080EP | F65555W00AP |
| F603L5A70FP | OPEN | OPEN | SHORT | ✕ | USE | | |
| F603L5090EP | OPEN | SHORT | OPEN | ✕ | ✕ | F603Y5090EP | |
| F603L5050EP | SHORT | OPEN | OPEN | ✕ | ✕ | | |




# 18. DIGITAL PROGRAMMER CIRCUIT (BPQ & GPG MODELS)

**PARTS LIST**

| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| BZ310 | | AEFBAT2001 | BUZZER | 1 | 2.0KHz |
| C221 | | AECUU06F103Z | CHIP CAPACITOR | 1 | 0.01 μ F/50V |
| C343 | | AECUU06C101J | CHIP CAPACITOR | 1 | 100PF/50V |
| C12, C340, C440 | | AECUT06F104Z | CHIP CAPACITOR | 3 | 0.1 μ F/25V |
| C330 | | AECUU06R102K | CHIP CAPACITOR | 1 | 1000PF/50V |
| C10 | | AECETK1V561B | AL CHEM CAPACITOR | 1 | 560 μ F/35V |
| CN1 | | AEEMXH01505W | CONNECTOR | 1 | 5 Pin |
| CN3 | | F03524U00AP | CONNECTOR | 1 | |
| CN4 | | AEEMXH00F04W | CONNECTOR | 1 | 4 Pin |
| CN6 | | AEEM09FDZBTM | CONNECTOR | 1 | 9 Pin |
| CX320 | | AEFOS800MG06 | CERAMIC RESONATOR | 1 | 8.0MHz |
| DISP110 | | AEDDHJ4V00BP | LCD | 1 | |
| DISP1 HOLDER | | F66175E40XN | LCD HOLDER | 1 | |
| | | F67525E40XN | DIFFUSION SHEET | 1 | |
| D10-D13 | | AESSRCT1A6-E | DIODE | 4 | |
| D40, D220-D224 | | AESS133T-77 | DIODE | 6 | |
| D25 | | AERZ511NS10D | VARSITOR | 1 | |
| D26, D27 | | AERZ102KD10A | VARSITOR | 2 | |
| D180-D189 | | AESQPY1112H | CHIP-LED | 10 | |
| IC1 | | MN101C54CEJ | L.S.I | 1 | |
| Q226 | | AESA14EKE | CHIP DIGI-TRANSISTOR | 1 | |
| Q182, Q222, Q223, Q224 | | AESC23JKE | CHIP DIGI-TRANSISTOR | 4 | |
| Q10, Q180 | | 2SD1859TV2Q | TRANSISTOR | 2 | |
| Q181, Q220, Q225 | | 2SC2412KT146 | CHIP TRANSISTOR | 3 | |
| R182, R183 | | AERJ06J101R | CHIP RESISTOR | 2 | 100 Ω, 1/16W, 5% |
| R224 | | AERJ06J103R | CHIP RESISTOR | 1 | 10K, 1/16W, 5% |
| R221, R228, R342, R343 | | AERJ06J104R | CHIP RESISTOR | 4 | 100K, 1/16W, 5% |
| R181R320, R227 | | AERJ06J220R | CHIP RESISTOR | 3 | 22 Ω, 1/16W, 5% |
| R220, R222, R223 | | AERJ06J222R | CHIP RESISTOR | 3 | 2.2K, 1/16W, 5% |
| R310 | | AERJ06J332R | CHIP RESISTOR | 1 | 3.3K, 1/16W, 5% |
| R330 | | AERJ06J333R | CHIP RESISTOR | 1 | 33K, 1/16W, 5% |
| R331, R441 | | AERJ06J471R | CHIP RESISTOR | 2 | 470 Ω, 1/16W, 5% |
| R360 | | AERJ06J472R | CHIP RESISTOR | 1 | 4.7K, 1/16W, 5% |
| R440 | | AERJ06J512R | CHIP RESISTOR | 1 | 5.1K, 1/16W, 5% |
| R10, R11, R311 | | AERDS2TJ102T | CARBON RESISTOR | 3 | 1K, 1/4W, 5% |
| R12, R180 | | AERDS2TJ103T | CARBON RESISTOR | 2 | 10K, 1/4W, 5% |
| R290 | | AERDS2TJ104T | CARBON RESISTOR | 1 | 100K, 1/4W, 5% |
| RY1, RY3 | | AEGG5G1A18 | POWER RELAY | 2 | |
| RY2 | | AEBJQ1A18 | POWER RELAY | 1 | |
| T10 | | AETP5L00QP | LOW VOLTAGE TRANSFORMER | 1 | |
| ZD10 | | AESZMTZJ5R6B | ZENER DIODE | 1 | |

# 19. DIGITAL PROGRAMMER CIRCUIT (EPG MODELS)

## PARTS LIST

| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| BZ310 | | AEFBAT2001 | BUZZER | 1 | 2.0KHz |
| C80, C81, C221 | | AECUU06F103Z | CHIP CAPACITOR | 3 | 0.01 μ F/50V |
| C90, C343 | | AECUU06C101J | CHIP CAPACITOR | 2 | 100PF/50V |
| C12, C222, C340, C440 | | AECUT06F104Z | CHIP CAPACITOR | 4 | 0.1 μ F/25V |
| C330 | | AECUU06R102K | CHIP CAPACITOR | 1 | 1000PF/50V |
| C10 | | AECETK1V561B | AL CHEM CAPACITOR | 1 | 560 μ F/35V |
| C13 | | AECETS1C220B | AL CHEM CAPACITOR | 1 | 22 μ F/16V |
| CN1 | | AEEMXH01505W | CONNECTOR | 1 | 5 Pin |
| CN3 | | F03524U00AP | CONNECTOR | 1 | |
| CN4 | | AEEMXH00F04W | CONNECTOR | 1 | 4 Pin |
| CN5 | | AEEM17F9604S | CONNECTOR | 1 | 17 Pin |
| CN6 | | AEEM17F9604S | CONNECTOR | 1 | 17 Pin |
| CX320 | | AEFOS800MG06 | CERAMIC RESONATOR | 1 | 8.0MHz |
| DISP110 | | AEDDHJ5R80EP | LCD | 1 | |
| DISP1 HOLDER | | F66175W00AP | LCD HOLDER | 1 | |
| | | F67525E40XN | DIFFUSION SHEET | 1 | |
| D10-D13 | | AESSRCT1A6-E | DIODE | 4 | |
| D40, D220-D225 | | AESS133T-77 | DIODE | 7 | |
| D25 | | AERZ511NS10D | VARSITOR | 1 | |
| D26, D27 | | AERZ102KD10A | VARSITOR | 2 | |
| D180-D189 | | AESQPY1112H | CHIP-LED | 10 | |
| PIN1, PIN2 | | AEPINIPS-1E7 | | 2 | |
| IC1 | | MN101C54CEK | L.S.I | 1 | |
| Q226 | | AESA14EKE | CHIP DIGI-TRANSISTOR | 1 | |
| Q182, Q222, Q223, Q224 | | AESC23JKE | CHIP DIGI-TRANSISTOR | 4 | |
| Q10, Q180 | | 2SD1859TV2Q | TRANSISTOR | 2 | |
| Q181, Q220, Q225 | | 2SC2412KT146 | CHIP TRANSISTOR | 3 | |
| SW1, SW2, SW21-SW23, SW28-SW30 | | EVQ11L05R | SLIGHT TOUCH SWITCH | 8 | |
| RSW90 | | AEVQSR172 | REVOLVING SWITCH | 1 | |
| RE80 | | AEVQECR1611E | REVOLVING ENCODER | 1 | |
| R182, R183 | | AERJ06J101R | CHIP RESISTOR | 2 | 100 Ω, 1/16W, 5% |
| R80, R81 | | AERJ06J102R | CHIP RESISTOR | 2 | 1K, 1/16W, 5% |
| R82, R83, R90, R94, R224 | | AERJ06J103R | CHIP RESISTOR | 5 | 10K, 1/16W, 5% |
| R221, R228, R342, R343 | | AERJ06J104R | CHIP RESISTOR | 4 | 100K, 1/16W, 5% |
| R91 | | AERJ06J152R | CHIP RESISTOR | 1 | 1.5K, 1/16W, 5% |
| R13 | | AERJ06J154R | CHIP RESISTOR | 1 | 150K, 1/16W, 5% |
| R95 | | AERJ06J163R | CHIP RESISTOR | 1 | 16K, 1/16W, 5% |
| R98, R181, R320 | | AERJ06J220R | CHIP RESISTOR | 3 | 22 Ω, 1/16W, 5% |
| R220, R222, R223 | | AERJ06J222R | CHIP RESISTOR | 3 | 2.2K, 1/16W, 5% |
| R96 | | AERJ06J303R | CHIP RESISTOR | 1 | 30K, 1/16W, 5% |
| R92, R310 | | AERJ06J332R | CHIP RESISTOR | 2 | 3.3K, 1/16W, 5% |
| R330 | | AERJ06J333R | CHIP RESISTOR | 1 | 33K, 1/16W, 5% |
| R331, R441 | | AERJ06J471R | CHIP RESISTOR | 2 | 470 Ω, 1/16W, 5% |
| R360 | | AERJ06J472R | CHIP RESISTOR | 1 | 4.7K, 1/16W, 5% |
| R440 | | AERJ06J512R | CHIP RESISTOR | 1 | 5.1K, 1/16W, 5% |
| R93 | | AERJ06J622R | CHIP RESISTOR | 1 | 6.2K, 1/16W, 5% |
| R97 | | AERJ06J683R | CHIP RESISTOR | 1 | 68K, 1/16W, 5% |
| R10, R11, R311 | | AERDS2TJ102T | CARBON RESISTOR | 3 | 1K, 1/4W, 5% |
| R12, R180 | | AERDS2TJ103T | CARBON RESISTOR | 2 | 10K, 1/4W, 5% |
| R290 | | AERDS2TJ104T | CARBON RESISTOR | 1 | 100K, 1/4W, 5% |
| RY1, RY3 | | AEGG5G1A18 | POWER RELAY | 2 | |
| RY2 | | AEBJQ1A18 | POWER RELAY | 1 | |

| Ref. No. | | Part No. | Part Name & Description | Pcs/Set | Remarks |
|---|---|---|---|---|---|
| T10 | | AETP5L00QP | LOW VOLTAGE TRANSFORMER | 1 | |
| ZD10 | | AESZMTZJ5R6B | ZENER DIODE | 1 | |

## 03/03 / S-5R2, S-5R5 / S-5R6, S-5R7 / S-5R8, S-5Q3 / S-5Q5, S-5Q7 / S-5Q8, S-5Q9 / S-6A0 / Printed in China